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CONTENTS.

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No. 1. *July.*

	PAGE
The Annual Address on the Progress of Geography, 1892–93. By the Right Hon. Sir Mountstuart E. Grant Duff, G.C.S.I., F.R.S.	1
Reports on Geography at the Universities	25
South-West Africa, English and German (From an economical point of view.) By Joachim Count Pfeil	29
Historical Evidence as to the Zimbabwe Ruins. By Dr. H. Schlichter	44
The Plateau of Lorraine	52
The Pevtsof Expedition and M. Bogdanovitch's Surveys. By E. Delmar Morgan	55
The Monthly Record	63
Correspondence	71
Meetings of the Royal Geographical Society	72
Geographical Literature of the Month	87
New Maps	94
MAPS AND ILLUSTRATIONS.—Count Pfeil's Route in South-West Africa	31
A Farm in Namaqualand	33
Well on the Farm	37
Chinese Turkistan, showing the Routes of Colonel Pevtsof and K. I. Bogdanovitch ..	96

No. 2. *August.*

Journeys in French Indo-China (Tongking, Annam, Cochin China, Cambodia). By the Hon. George N. Curzon, M.P.	97
With the Railway Survey to Victoria Nyanza. By Captain J. W. Pringle, R.E.	112
The Ancient Trade Route across Ethiopia. By J. Theodore Bent	140
A Forgotten Voyage of John Davis. By William Foster	146
Records of the East India Company. By Stephen Wheeler	150
The Surveys of India, 1891–92	152
Dr. Thoroddsen's Explorations in Iceland	154
Dr. Siemiradzki's Explorations in Patagonia	158

PAGE

Geography at the Forty-second German Educational Congress 162
The Monthly Record 165
Correspondence 177
Obituary 180
Meetings of the Royal Geographical Society 182
Geographical Literature of the Month 184
New Maps 190

MAPS AND ILLUSTRATIONS.—Bay of Along 99
Small Lake, Hanoi 103
Mau Forest 115
Ngari Davash, Mau Forest 121
View in Sotik 127
Map of Trade Routes across Ethiopia 141
Sketch-Map of Iceland 155
Map showing Dr. Siemiradzki's Routes in North-West Patagonia 159
Mombasa-Victoria Lake Railway 192

No. 3. *September.*

Journeys in French Indo-China (Tongking, Annam, Cochin China, Cambodia) —*Conclusion.* By the Hon. George N. Curzon, M.P. 193
The Zoutpansberg Goldfields in the South African Republic. By Fred. Jeppe 213
The Stairs Expedition to Katangaland. By Joseph A. Moloney, L.R.C.P., Medical Officer to the Expedition 238
Portuguese East India Records 248
A Trip to Harar and Imé. By Captain H. G. C. Swayne, R.E. 250
The Physical Geography of Antarctica 252
The Geography of the Tatra Group 255
Dr. Diener's Expedition to the Central Himalaya 258
The Monthly Record 261
Obituary 275
Geographical Literature of the Month 276
New Maps 283

MAPS AND ILLUSTRATIONS.—Main Approach to Angkor Watt 199
Sketch-Map—Route Turan to Hue 203
Woodbush Village and the Mpohme or Woodbush Mountain 215
The Swohla Peak, Zoutpansberg 221
Manhopi, extreme Western termination of Zoutpansberg Range 227
Eland's Kopjes, Duur-en-Duur 233
Sketch-Map of the Central Himalayan Range .. 259
Sketch-Map of the Corinth Canal 262
French Indo-China and Siam. To illustrate journeys by Hon. G. Curzon, M.P. 288
Map of the Zoutpansberg Goldfields. Compiled by Fred. Jeppe 288

No. 4. *October.*

PAGE

Exploration in the Mustagh Mountains. By W. M. Conway 289
Lieut. Peary's Arctic Work. By Cyrus C. Adams 303
The Influence of Geographical Position on the Development of the Australian Natives. By Ernest Favenc 316
The Konde Country. By the Rev. Dr. Merensky 321
M. Casimir Maistre's Journey from the Congo to the Shari and Benue 323
Mr. Gregory's Expedition to Mount Kenia 326
Geography at the British Association, Nottingham Meeting, 1893 327
The North Polar Basin. By H. Seebohm 331
Dr. Nansen's North Polar Expedition 346
On the Teaching of Physiography. By P. Krapotkin 350
Luigi Bricchetti Robecchi's Journeys in the Somali Country 359
The Monthly Record 362
Correspondence 376
Obituary 377
Geographical Literature of the Month 377
New Maps 383

MAPS AND ILLUSTRATIONS.—Sketch-Map, Greenland, showing Peary's Proposed Work, 1893–4 305
Sketch-Map of Konde Country 321
Sketch-Map of Maistre's Journey 324
Sketch-Map, Somali-land, showing the Routes of L. Bricchetti Robecchi, 1890–1 360
Six Polar Charts, illustrating Mr. Henry Seebohm's Presidential Address, Nottingham, September 1893 384
Map showing Route of the North Greenland Expedition of 1891–2. Lieut. R. E. Peary, U.S. Navy 384

No. 5. *November.*

Journeyings in the Pamirs and Central Asia. By the Earl of Dunmore 385
Routes and Districts in Southern Nyasaland. By Lieut. B. L. Sclater, R.E. .. 403
The Determination of Geographical Longitudes by Photography. By Henry G. Schlichter, D.Sc 423
A Voyage toward the Antarctic Sea, September 1892 to June 1893 429
The Ruins in Mashonaland 438
Formosa 441
Journey through Central Manchuria. By the Rev. J. A. Wylie 443
Hausa Pilgrimages from the Western Sudan, together with a Native Account of the Death of General Gordon. By the Rev. C. H. Robinson, M.A. .. 451
The Monthly Record 454
Obituary 465–470
Geographical Literature of the Month 471
New Maps 477

PAGE

MAPS AND ILLUSTRATIONS.—The Zambesi and Shire Rivers from Chinde to Chiromo 405
Map of Central Asia showing route of the Earl of Dunmore 480
The Shire Highlands, showing the routes of B. L. Sclater, B.E., F.R.G.S. 480

No. 6. *December.*

The Present Standpoint of Geography. Opening Address of the President, Mr. Clements R. Markham, C.B., F.R.S. 481
Geographical Results of the Anglo-Portuguese Delimitation Commission in South-East Africa, 1892. By Major J. J. Leverson, R.E. 505
The Limits between Geology and Physical Geography 518
Mr. Astor Chanler's Expedition to East Africa 534
The Great Barrier Reef of Australia. By Henry O. Forbes 540
The Monthly Record 546
Correspondence 557
Obituary 559
Meetings of the Royal Geographical Society 559
Geographical Literature of the Month 560
New Maps 569

MAPS AND ILLUSTRATIONS.—Sketch of the Road from Mapanda to Massi-Kessi 507
View of the Lusitu River 509
Falls and Rapids of the Sabi River six miles above its junction with the Lundi 511
The Spoon of an Elizabethan Navigator 556
Map of the Anglo-Portuguese Boundary in East Africa 576

The
Geographical Journal.

No. 1. JULY, 1893. Vol. II.

THE ANNUAL ADDRESS ON THE PROGRESS OF GEOGRAPHY, 1892-93.*

By the Right Hon. Sir MOUNTSTUART E. GRANT DUFF, G.C.S.I., F.R.S., *President.*

This year, as last, I may fittingly begin my address by saying something about our Evening Meetings. Of these, since our last anniversary, we have had sixteen, of which fourteen were regular and two were extra. At the first, which was held on June 20th, the Paper read was by Mr. Markham, whose name has been so long and so honourably connected with this Society. The subject was the life and discoveries of Columbus as seen in the light of recent research. It was published in the September number of our *Proceedings*, and formed a worthy tribute to the illustrious navigator, the fourth centenary of whose great achievement was so widely celebrated.

In it Mr. Markham tells us that much light has been thrown on the birth and early life of Columbus of late years by the examination of records at Genoa and Savona. He has little doubt that the great man was born in Genoa and baptised in the old church of San Stefano in the year 1447. He thinks that Columbus conceived the idea of sailing westward to the Indies even before he left Savona, whither he went with his father and mother in 1472. Having established these preliminaries, Mr. Markham discusses the alleged decision of the University of Salamanca against the proposals of the now world-famous adventurer, and finds that it rests on a very slight basis. He then considers the size and equipment of the ships, subjects which have been much discussed of recent years, and the still more keenly debated question of the landfall. As to this he says: "The spot where Columbus first landed in the New World is the eastern end of the south side of Watling Island. This has been established by the arguments of Major and by the

* Delivered at the Anniversary Meeting, May 29th, 1893.

calculations of Murdoch beyond all controversy. The evidence is overwhelming. Watling Island answers to every requirement and every test, whether based on the admiral's description of the island itself, on the courses and distances thence to Cuba, or on the evidence of early maps. We have thus reached a final and satisfactory conclusion, and we can look back on that momentous event in the world's history with the certainty that we know the exact spot on which it occurred—on which Columbus touched the land when he sprang from his boat with the standard waving over his head."

Mr. Markham proceeds to defend his hero from the charge of inaccuracy which has been brought against him with reference to his homeward journey, showing that the charge of inaccuracy rests on the mistake of a copying clerk, and that the reckoning kept by him in his little vessel, the *Niña*, of 40 tons, was singularly accurate. Mr. Markham concludes by showing what an extraordinary impulse the discoveries of Columbus gave to other navigators, and cites the reasons which make him believe that a portrait preserved at Como (and of which a reproduction, taken from a photograph, is given in our *Proceedings* along with Mr. Markham's Paper) was really taken from life.

The first of our autumn meetings on November 5th was an extra one, called for the purpose of listening to a Paper on Uganda read by Captain Lugard to an enormous audience, so enormous that even the gallery of this theatre was quite full. He described his various journeys into the interior from Mombasa, a view of which was shown and explained by Mr. George Mackenzie, the former Administrator of the British East Africa Company. Amongst these journeys was one to explore the River Sabakhi, and to build stockades upon it, another to open up the little known country of Kikuyu, and a third to occupy Uganda. Capt. Lugard reached that country after crossing a high region covered with splendid natural pasture of grass and clover, which he believes would be eminently favourable to European colonisation. Thence he descended to the Kavirondo Plain, where he found himself amidst a dense population of very simple, good-hearted people, all of whom, men and women, repudiate any kind of clothing; thence he passed to Busoga, where everybody, men and women alike, wears garments made from the barks of various figs, and dyed black. Uganda itself he described as a country of low hills and valleys, with hardly an acre of level ground to be seen. Unyoro is a country of more lofty hills and peaks of granite, while both of them have the disagreeable peculiarity of being watered by few streams, and having, in their stead, river swamps in almost every valley. Specially interesting were the details of the expedition, made by Capt. Lugard from Uganda in 1891 to come into relations with the Sudanese refugees from the Equatorial Province, who had assembled on the south-west shore of the Albert Lake. He had to tell too of the Salt Lake and of the Semliki River, fed in its lower course below the Lake Albert

Edward by hundreds of streams of snow-water from the great mountain, Ruwenzori, a fine photograph of which was much admired.

With great tact and judgment Capt. Lugard avoided all political or religious questions, and wound up his remarks with the following sentences, to whose Semitic turn of phrase and lapidary strength I called the attention of those present as soon as he had sat down:—

"So I brought down the Sudanese from Kavalli; and I built five forts from north to south from the Albert to the Albert Edward; and I located the Sudanese in them by regiments and companies; and I left Mr. De Winton in charge of Toru—the country bordering the base of the Ruwenzori Range—with orders to protect these people, both from the licence of the Sudanese and from Kabarega. And when the people saw that we had built these forts and left these Sudanese, and a European was come to live among them, they doubted no longer that we meant to protect them, and place a barrier between them and Kabarega on the one hand, and the Manyema on the other. And De Winton wrote to me shortly afterwards and said they were escaping from their slavery in Unyoro, and coming in on every side by thousands, with great rejoicing.

"And De Winton did as I had told him, and went round the country with Kasagama, and appointed chiefs to districts, and helped him to arrange the country in peace—such peace as it had not known for years and years. And in this task this brave young officer died."

At the next meeting, on November 14th, the first regular one of the Society during the session, Dr. Nansen was the hero, and explained to an audience, almost as numerous as that which listened to Captain Lugard, his plans for exploring the Arctic Regions. He described the vessel called the *Fram*, that is the "Forward," which he has had built near Christiania for the peculiar service he means her to undertake. In her he proposes to pass through the Kara Sea and to arrive near the mouth of the Lena. Thence taking advantage of the current of relatively warm water brought down by that river, he intends to advance northwards and to get into the ice which he believes will convey him over or near the North Pole towards the coast of Greenland, and so into more or less known regions. His arrangements, which showed infinite resource and ingenuity, were criticised in a most friendly manner by several of the most noted Arctic authorities, but most of them were rather friendly than hopeful. Admiral Inglefield was very encouraging, and mentioned the fact that he had himself seen a large log of wood on the west coast of Greenland which could by no possibility have come from anywhere save Siberia, and must have taken very much the course which Dr. Nansen had decided to follow. Dr. Nansen's paper was itself full of very weighty statements as to the manner in which the Polar currents carry Siberian produce to the Greenland Coast.

Captain Lugard's Paper having been read first at the moment when Uganda was exciting so very much interest in the political world, drew a huge multitude to the doors of this theatre, a multitude far greater than it could accommodate. We had accordingly, on November 24th, an extra or, so to speak, overflow meeting, at which it was again read under the Presidency of our Foreign Secretary, General Sir C. P. Beauchamp Walker.

On November 28th we had the pleasure of listening to our old friend, Mr. Joseph Thomson, who gave us an account of his expedition from the shores of Lake Nyasa towards Lake Bangweolo and the head-waters of the Congo; an expedition in which he showed all the courage and endurance with which we are so familiar in his character. By this time I think he has walked over something like 18,000 miles of Africa. His young companion, Mr. Grant, who, as Mr. Thomson's first lieutenant, proved himself a worthy son of "Grant of the Nile," was also welcomed by us that evening, and delivered a speech which was extremely well received by the members present.

On December 5th the temperature had fallen to below freezing-point, and the zeal of the Society had, for the moment, declined with the temperature; so that the audience which came to welcome Mr. Wilkinson and Captain Gallwey was only moderately numerous. The first had to tell us about the so-called Kalahari desert which he approached through Bechuanaland. He found it far from a desert—rather a sandy region overgrown with spiny trees and shrubs, often so intricate as to present great difficulties to a traveller moving with ox-waggons. He traced the Molopo River through a good deal of its course not hitherto—so far as I know—described.

Captain Gallwey, H.M.'s Vice-Consul in the Oil Rivers, had visited the city of Benin, still a disgusting centre of the worst sort of African savagery, but likely, we may hope, ere long to be affected by better influences, and had a good deal that was interesting to say about the beauty of the waterways of that region at a distance from the coast, their crystal purity and great depth, as well as the charms of the vegetation upon their banks. It was agreeable to hear that they had no attractions for the sportsman, save in the shape of alligators and curlews, of whom the latter, it may be hoped, will have the sense to disappear if that predatory species makes its appearance in any numbers.

The Paper on December 19th was read—and very well read—by Captain Dundas, R.N., the same whose adventures on the Tana were recounted to us some time ago, not, however, by himself, but by Mr. Gedge. To-night we were taken to the Jub River, which Captain Dundas ascended for some 400 miles unaccompanied by a single European, without firing a single shot in anger. More than once, however, he was in imminent danger of his life amongst the fierce

Somali population. The story of his landing at Bardera accompanied only by a single interpreter, walking straight up to the chief and asking him whether it was to be peace or war, when he knew it depended on a nod from that savage potentate whether he should or should not be instantly murdered, deserves to be remembered as a very striking illustration of British courage and coolness.

At the first meeting of the year 1893, held upon January 16th, the Paper was read by Mr. Charles Hose, an official of the Saráwak Government, and contained an account of a journey made by him up the Baram River to the highlands of Borneo, which included an interesting description of the ascent of Mount Dulit, a flat-topped hill over 5000 feet high. Mr. Hose had paid considerable and most creditable attention as well to the flora as to the fauna of the district which he had traversed; and Mr. Bowdler Sharpe, of the British Museum, bore testimony to the very excellent work which he had done as an ornithologist. Some of Mr. Hose's experiences were sufficiently curious, as, for instance, the following:—"One morning one of my Dyak hunters returned, declaring that he had heard a tiger. Being very unwilling to believe this, and wishing to convince them that no tiger exists in Borneo, I took a Dyak and two Punans with our guns, and having walked half a mile in the direction pointed out to us, we heard a strange booming noise, very loud it is true, but not much resembling the roar of a tiger. I asked the Punans what they thought it was, and they replied 'Jawi,' toad. As we came up to the spot, the noise seemed to resound through the rocks, and sure enough, between the crevices, was a toad of gigantic size, bellowing lustily. As we tried to catch him, he backed further into his hiding-place until he was out of reach, and we were obliged to give up the hope of securing him; but a few days afterwards we procured a fine specimen of this toad, which measured 14½ inches round the belly, and 3 inches across the head. It had a hard rough black skin with warty excrescences on the back. These warts contain a poisonous fluid, some of which a Punan took, and, placing it in the toad's mouth, destroyed the creature, and its skin is now in the British Museum." The toad has been the subject of many strange legends; but I do not know that anything has been said of it much more strange than what is contained in the above paragraph.

Our next meeting took place on January 30th. At it two Papers were read. The first was by Professor Milne, who was absent in Asia; but the other was read by its author, Mr. A. H. Savage Landor, the representative of a name illustrious in English literature, and himself an artist of very considerable merit, who was with us. Both described journeys in the Northern Island of Japan, which we usually—but, apparently, incorrectly, for the Japanese name is Hokkaido—speak of as the Island of Yezo.

On February 13th we had Mr. Selous, the mightiest hunter of these

or, I suppose, of any other times—mighty, too, not only in the slaying of lions, but in the advancement of civilisation, and to whom I have had this afternoon the agreeable task of presenting the Founder's Medal.

On February 20th a Paper on his journey across Tibet was read by Captain Bower, of the 17th Bengal Cavalry, a journey during which he went over some 800 miles of new country, to say nothing of having spent about half his time at altitudes of from 14,000 to 16,000 feet above the level of the sea. It is the hard fate of modern travellers in Asia to be able to add to human knowledge only at the expense of spending months amongst some of the most detestable regions on the surface of the globe—regions which are unknown chiefly because no one is willing to inhabit them. Here is Captain Bower's general sketch of a large portion of the howling wilderness which he traversed.

"The whole of Central and Northern Tibet, and almost the whole of Western Tibet, is known as the Chang. It consists of a high tableland with hills, mostly of a rounded character; but here and there sharply-defined snowy ranges are met with. The mountains have a general east and west tendency, but no defined watershed exists; rivers may be met flowing in almost any direction, and all terminate in large salt lakes. These lakes appear to have been at one time much larger than they now are, as unmistakable signs that they are drying up are to be seen. An idea of the physical configuration of the country may be gathered from the fact that for five months we never once camped at a lower altitude than the summit of Mont Blanc; and all the enormous stretch of country we covered in that time contained not a single tree. The greater part of this Chang is, of course, uninhabitable for the greater part of the year, and most of the places that would afford grazing in summer are too far distant from suitable winter quarters to be availed of by the nomads. But round the edges a few are to be met with, living almost entirely on meat and dairy produce."

Our Honorary Secretary, Mr. Seebohm, gave, after the Paper had been read, an interesting account of the birds which had been procured during the expedition, consisting as it did of only seven species, but all of extreme rarity; while Mr. Thiselton Dyer, the Director of the Royal Gardens at Kew, has reported that amongst the one hundred and thirty species found by Dr. Thorold about half a dozen were absolutely new to science. The peculiar mode of growth adopted by well-known species in the Tibetan climate had also much interest for the botanist.

The Council had not a little difficulty in deciding between the rival claims to one of our medals for this year, which were advanced in favour of Captain Bower and the reader of the Paper of February 27th, and its decision might, I think, with great propriety, have been given on either side.

The reader of the Paper to which I allude was Mr. Rockhill, already

well known as the author of the 'Land of the Lamas,' who addressed us upon his more recent travels in Tibet. I wish we could also have welcomed him in person this afternoon, but I have, as you are all aware, had the honour and pleasure of handing the gold medal won by him to the representative of the great nation to whom his attainments as a student in the languages of the Far East and of a successful traveller have brought additional honour.

On March 13th we had a Paper from Mr. H. O. Forbes, well-known as a naturalist and as a traveller in the Eastern Archipelago. Its subject was the Chatham Islands and their relation to a former Southern Continent. These Chatham Islands—for there are others—are a small group 500 miles east of Port Lyttelton in the South Island of New Zealand, which Mr. Forbes had visited during the time he was in charge of the Museum at Canterbury. He had been led to visit them chiefly on account of a fragment of a bird's skull having been brought to him which excited his interest and surprise in a very high degree. After he reached the Islands he became certain that the bird was a species of Aphanapteryx, a large and remarkable member of the rail family which lived in the Island of Mauritius contemporaneously with the Dodo. From Mauritius it disappeared a couple of hundred years ago; but in the Chatham Islands it lived till recently. Taking occasion from the presence of this bird and a variety of nearly-related facts, Mr. Forbes argued in favour of the conclusion that it is highly probable that Professor Huxley's and Professor Kitchen Parker's divisions of the globe according to the distribution of life into a northern and into a southern land—an arctogœa and a notogœa—will turn out to be the two fundamental biological divisions of the globe, there was a centre of development at both poles, and that the wanderings and migrations of the fauna and flora, northwards or southwards, from age to age, and from one side of the Equator to the other, were regulated by glacial and genial periods, and by the elevation and subsidence of the land, or the flux and flow of the sea over the continental shelf. Dr. Günther and other distinguished naturalists were, as might have been expected, attracted to our meeting by a Paper which touched, at so many points, their favourite studies, and we enjoyed the great advantage of listening to their views upon the questions raised by Mr. Forbes.

On March 27th we made an excursion into the territories of our neighbours and friends of the Geological Society. I think it is desirable that we should occasionally, though not too often, cross both their frontiers and those of the Linnean with a view to keeping before the world our just claim to deal with everything which relates to the theatre of man's activity.

On this occasion the reader of the Paper was Professor Bonney, who maintained that glaciers constantly abrade but very rarely excavate.

The views of the late Professor Ramsay found a supporter, though by no means an uncompromising one, in a distinguished member of your council, Mr. Blanford, while Sir Henry Howorth, Mr. Freshfield, and Mr. Conway supported Professor Bonney's opinions.

At our next meeting, when we were honoured by the presence of the Prince of Wales, Mr. Curzon read some of the lighter portions of a Paper, which will duly appear in our *Journal*, upon his recent tour in French Indo-China.

Our very latest meeting was devoted to the Karakoram Ranges and their glaciers, of which Mr. Conway, who lately visited them, helped to a considerable extent by the Geographical Society, gave a very interesting account. Putting aside the Uganda evenings, and that which was given to Dr. Nansen, this was perhaps the most successful which we have had since the last Anniversary Meeting. Mr. Conway's skill as a lecturer, and the very intelligent way in which the slides were brought before the audience, gave him great advantages in addition to those which were supplied by the subject itself. Col. Godwin Austen, the first pioneer of serious explorations in those remote regions, attended the meeting and addressed us after Mr. Conway had come to an end. The occasion was further signalised by the exhibition of very admirable sketches by Mr. McCormick and General Sir Michael Biddulph. The former accompanied Mr. Conway, as did a son of our trustee and former president, Lord Aberdare. Mr. Conway spoke most highly of Mr. Bruce's services, as well as of those rendered by the Ghoorkas under his command. Mr. Freshfield pointed the moral of the tale when he showed that in the employment of those Ghoorkas lay the future of Himalayan and trans-Himalayan exploration.

On the whole, I should be inclined to say that the meetings of this year have given more general satisfaction to the Society than those of any of the three previous years which have been held under my presidency, with the exception of the large one of 1890 in the Albert Hall, and I think the custom of adjourning to inspect the objects of interest in the next room after we have left the theatre, has become established as an institution.

I take this opportunity of once more thanking the Senate of the University of London for their great kindness in allowing us to assemble in this building.

The 'Proceedings' and 'Journal.'

The issue of our *Proceedings* was continued regularly up to the end of 1892, but with the commencement of this year we took a new departure. It was thought desirable to enlarge the publication and to send it out to the world in a form more likely to attract the general reader than that in which it had previously appeared. There was

reason to think too that the old colour suggested a little too much a style of literature which carries our thoughts to Westminster and has obtained a reputation for dulness which perhaps it only partially deserves. We adopted accordingly a more attractive cover, and the result, whether of the internal or external merits of the *Geographical Journal*, as it is now called, has been that we have sold to the public during the first four months of the year on an average two hundred more copies each month than we used to do. Both in the old *Proceedings* and in the new *Journal* there have been a variety of papers and notices which have deserved much attention over and above the reports of our evening meetings.

I may mention one by Mr. Markham on the late Professor Freeman and his services to geography. Mr. Markham says that that distinguished man gave to geography its true place with reference to history, doing thereby good service to both departments of knowledge, and that his method will add a far wider and more numerous class of enquirers to the votaries of our science.

Then there were two Papers on the Orthography of Geographical Names by Colonel Dalton, and one by Mr. Freshfield on the Glacial Catastrophe in Savoy, which caused so much loss of life last year at the baths of St. Gervais. He described it as the explosion of a glacier by the stoppage of the subglacial water channels which drain it, or in other words, an avalanche riding on a flood.

Mr. Topley's account of the causes of the Sandgate landslip found, I doubt not, many readers.

A brief account in our October number of the railway from Antofagasta into the interior, by Mrs. Lilly Grove of Oxford, showed that additions may be made to our knowledge without passing beyond a region where civilised modes of travel prevail. A careful series of notes on recent explorations in British New Guinea, by Mr. Coutts Trotter, was reproduced in our November number after having been read at the Edinburgh meeting of the British Association; and in the same number there was an account of the Columbus meeting at Genoa, forwarded by Mr. Cust. He was prevented by illness from attending it, but his daughter supplied his place, and we are much obliged to her for the information with which she supplied us.

There is in our February number a brief but very interesting note upon the works of reclamation which have been carried on amongst the marshes of Western Russia. The figures are indeed almost startling, for we read of 800,000 acres transformed into meadow-land, and nearly 1,200,000 acres, which formerly consisted of impracticable marshes, dried and turned into forest land. In fact, if we can credit this account, the famous Pinsk Marshes have been to a great extent covered by prosperous farms.

The Reclamation of the Zuyder Zee, so often vaguely talked about,

has now been taken up in a more business-like way, and a sketch of the great work, by which it is proposed to accomplish it, is given in our *Journal* for March. It will require, however, an expenditure of £16,000,000, and the labour of a generation. If the hopes of its projectors are fulfilled, it will add something like half a million of acres to the land area of Holland.

Another great European improvement, the removal of the Iron Gates, forms the subject of a brief Paper in the same number. This has been going on steadily for a considerable time, and its completion may, we are told, be looked for in 1895.

Mr. Clinton Dent's Paper, On the Physiological Effects of High Altitudes, in our January number, will appeal to an already large and, if the Himalayas are to be seriously attacked, an increasing public.

Papers on Chitral and Chilas, the last by Sir Michael Biddulph, have a special interest at this moment, thanks to political circumstances, as has a brief account of Major Brown's work on the Fayum and Lake Moeris. I might, however, prolong this list considerably without mentioning all the Papers of merit, and must pass on to other matters.

In the geographical literature of the month we have reverted to an earlier system than that which has recently prevailed, of giving a brief non-critical notice, not only of books added to the library, but of papers of importance in the various departments of Geography which appear in periodical publications, and the organs of geographical and other societies. This section of our *Journal* is, in short, an index to the geographical literature of the month, so that by glancing at it the reader can, in a moment, see whether anything has appeared which is important to his own studies.

Geography occupied an important place at the British Association last autumn. Dr. James Geikie's opening address "On the Geographical Development of Coast Lines" was printed in our September number, in which were also summarised two Papers read to the Association by the Prince of Monaco, one upon a New Chart of the Currents of the North Atlantic, and the other upon the Proposed Establishment of Meteorological Observations at various points of that ocean, more especially in the Azores.

The last supplementary Paper published is a complete biography of Morocco, compiled by Sir Lambert Playfair and Dr. Robert Brown, both names which have long been honoured amongst geographers, and both of whom the Council has thanked for this excellent piece of work.

I pass now to the miscellaneous duties of the Society.

Miscellaneous Duties of the Society.

We keep open, in return for the annual vote of £500 which is taken on the estimates, a map collection of great size and value which is open

to the public at large. During the last year about 2500 persons visited the map-room, but as I pointed out at our last Anniversary Meeting, we want a great deal more room, and could do much more valuable work for the public if we had it. I mentioned a year ago that we had about forty thousand books, fifty thousand maps or charts, seven thousand atlases, four thousand photographs, all of which have been steadily growing, as has also our stock of instruments. Many are the claims made upon us for the loan of these both by government officials and private persons.

Our work in the way of map-making is steadily increasing. Although our staff works exceedingly well, we are obliged to get a good deal of our map-drawing, fully half of it, I should think, done outside.

Twenty-four intending travellers have during the present year received instructions from Mr. Coles in route-surveying, and other matters of importance to them. Mr. Conway and Mr. Selous worked after their return for weeks in our offices constructing their own maps, a fact which shows how seriously the English traveller is beginning to take to the scientific side of his work. It will be remembered that those gentlemen won their earliest laurels, the first as an Alpine climber, the second as a slayer of wild beasts. The step is long from those commencements to the high position which they have now attained in connection with geography.

The long discussions which we have had with respect to the obtaining of geographical information from the Government of India have been brought, I trust, quite to an end by a letter from the India Office, by which we are informed, under the authority of the Secretary of State, that in the case of future reports the Indian Government has undertaken to make the geographical and statistical information in them available for the Royal Geographical Society by separating such information, where it is possible, from that which is confidential.

An earnest of good things to come has been given us by the forwarding to the Society of Captain Bower's report. Although my own connection with your affairs is coming to an end, I am sure I can promise for my successors that they will take very special care to play in every way into the hands of the Indian Government, and to make our alliance as mutually advantageous as possible. It is particularly agreeable to me that a controversy which I most deeply regretted should have been brought to so satisfactory a conclusion before my retirement.

Last year it was thought that it would be agreeable to the Fellows to revive the anniversary dinner, which had been intermitted for some years. A very large company, including many very distinguished persons, assembled to express their sympathy with the Society in its work, and the great success of that gathering had probably something to do with the considerable increase which has taken place in our numbers.

At the corresponding dinner of this year, which took place on the 13th, speeches were delivered by, amongst others, Sir Francis Grenfell, Mr. Bryce, Chancellor of the Duchy of Lancaster, Mr. Selous, Lord Kelvin, President of the Royal Society, Sir Robert Herbert, Sir Charles Tupper, Sir George Bowen, His Excellency the Swedish Minister, and Mr. Thiselton Dyer, the Director-General of the Royal Gardens at Kew.

One of the features of this gathering was the presence of representatives from various Provincial Societies, who found an able spokesman in Mr. Steinthal, of Manchester. Many years ago a resolution was passed at a General Meeting in favour of drawing closer the bonds which unite us with the other Geographical Societies of the Empire; these have much multiplied of late, increasing at the same time in activity, and it has been part of the recent policy of your Council to give the very fullest effect to a resolution which had lain dormant. Our relations with all the Geographical Societies of the Empire are becoming increasingly intimate, and these would of themselves be quite sufficient to force on certain improvements in our arrangements which must soon come about, thanks to the increasing progress of intelligence. The Provincial Societies are a sort of automatic recruiting ground, sending us new Fellows without any trouble on our part.

And new Fellows we most decidedly want, for our obligations are increasing. True, it is, that during the last four years we have made a very great increase. In the year 1889–90, when the excitement about Mr. Stanley's journey was running breast high, and when we had the great meeting in the Albert Hall, our net increase was one hundred and thirty-one; the next year, when there was no very special excitement, it was eighty-four. In 1891–2 we had a great many new elections, but the terrible influenza epidemic ran up our Obituary, and instead of an average of eighty we had one hundred and fourteen deaths. The result was a small net decrease, a decrease of twenty-three. This year, however, the tide has turned, and turned with a vengeance; we have a net increase of one hundred and forty-four gentlemen and twenty-two ladies, one hundred and sixty-six in all. In other words, during the four years in which I have had the honour to be your president, I have seen your numbers increased by three hundred and fifty-eight, and they are now close upon three thousand seven hundred; but we want them all and many more, for before long we shall have to take into the most serious consideration the acquisition of a new domicile. Our constantly increasing collections would of themselves, as I have pointed out before, ere long drive us from our present quarters, and we have, in addition, reason to believe that even if we could extend our borders where we now are, on anything like reasonable terms, which we cannot, certain changes in the streets in this part of the town would ere long improve us off the face of creation. Then, although the University of London has

been most kind to us in lending us their theatre, and although the character of our papers and of our publications, as well as our position as the leading geographical society of the world make us, I think, not unworthy recipients of the kindness of an university, whose operations extend over the whole of the British Empire, we cannot look forward to the present state of things continuing for an indefinite period. A vote of the Senate might at any time put an end to it.

We do, no doubt, more for the Government of this country by a very great deal than any other Society save the *doyen* of all societies, the Royal Society, but others, owing to historical reasons, had the good fortune to be accommodated in a Government building in which no room was found for us, and so we are thrown back upon our own resources. In default of finding a Mr. Tate amongst our Members we must eventually buy land for building purposes, and we have steadily been keeping this matter in view without arriving as yet at any definite result. Land in this part of the town is enormously costly, and, if we were to go to any other, we might easily lose some of the attractions and advantages which we are now able to offer to our Fellows.

I cannot help thinking that sooner or later some Government may recognise, in a practical form, the obligations which they all recognise in words, and give us some facilities such as Governments can give to public bodies without any burthen on the tax-payer. Still, our first duty is to help ourselves, and that, as you have just heard, we are doing by increasing our numbers. Nor must it be forgotten that since the commencement of this year the entrance fee has been increased without any prejudice to the number of our candidates.

Amongst the expeditions which we have aided in the course of the year have been those of Mr. Conway and Mr. Theodore Bent. You all know how well the first has succeeded, and ere long I doubt not that Mr. Bent will have a good deal to tell us of his travels in Abyssinia, whence he has just returned. Mr. Pratt, to whom we gave some assistance with a view to his intended explorations in the Valley of the Amazons, unhappily broke down in health and was unable to proceed with his work. Dr. Nansen has also received, as you are aware, some help from us. While he is making the final preparations for his start, various other proposals for Arctic exploration are being brought forward. One of these has for its author an Englishman, Mr. F. G. Jackson, who describes his intentions in the April number of our *Journal* in the following words:—

"The objects I have in view in my projected journey may be conveniently summarised under two heads: (1) The general exploration of Franz Josef Land, and in particular the discovery and mapping of its northern regions; the observation of the climatic conditions encountered; the recording of such geological evidence as is met with; and the

general investigation of the geographical conditions of the country. (2) An advance in a northerly direction, which shall be so far continued as to bring me within the immediate locality of the North Pole, and an endeavour, by all means in my power, to observe the geographical conditions at that mathematical point. Speaking generally, my plan may be described as an advance northward on land as far as such land continues—an advance which shall be made more secure and more open to retreat by the establishment of a series of depôts, reaching at intervals of about 100 miles from about the parallel of 80° to the most northern point of the land, or the locality of the North Pole, whichever shall be met with first."

Mr. Jackson adds:—

"Under the most favourable conditions—which I would assume to be the stretching of Franz Josef Land into the immediate regions of the Pole—we might achieve our objects, and return to the southern shores of Franz Josef Land in the late summer of 1894. At any rate, by the summer of 1895 I think we should have proved whether the Pole is practicable or not by the Franz Josef Land route, and be in a position to return to Europe. Thus we require two years in which to attain all our objects, or prove the impracticability of attaining one of them. In any case I shall endeavour, with all my power, to bring back a faithful report of the geographical conditions in a region of the Earth more northerly than any that has yet been observed or, indeed, reached."

These are large designs, and it would no doubt have been well if Mr. Jackson had made a preliminary journey, like that which carried Dr. Nansen across Greenland. He has not asked the Society for any assistance, but proposes to make his expedition entirely as a volunteer, and in no way under our auspices, though we wish well, of course, to him as to all other explorers.

Many of you are aware that a departmental committee was appointed by the Board of Agriculture in April, 1892, to examine into the work of the Ordnance Survey and various proposals which had been made for the improvement of the same. It examined more than thirty witnesses, and reported with special reference (1) to the steps which should be taken to expedite the completion and publication of the 1-inch maps of the British Isles; (2) to the permanent arrangement which should be made for the permanent revision of maps on various scales; (3) to the question whether the maps as at present issued satisfy the reasonable requirement of the public in regard to style of execution, form, information conveyed, and price, and whether any improvement could be made in the catalogue and indexes. Your Council made some recommendations to the Committee, and your Hon. Sec., Mr. Freshfield, appeared as a witness before it. The Committee, which was a strong one, accepted nearly all the recommendations, which comprised the speedy completion of the 1-inch

survey, frequent revision, better distinction of roads and footpaths, the delineation of the contours of the sea-bottom round the coast-line, the production of a new map in colours, the union around towns and in tourist districts of the existing sheets of the Ordnance Survey, done on the 6-inch and 1-inch scales, so as to form special maps for such districts in which all new cartographical improvements might be from time to time introduced.

If these recommendations are carried into effect—Parliament providing the necessary funds—much credit will, I think, be due to your Society, and more especially to Mr. Freshfield, who has devoted a great amount of labour to this matter, as he has indeed to everything connected with your affairs while I have had anything to do with them, and for many years before my period of office commenced.

Our Educational Work.

I went at great length last year into the subject of our educational work. It will be quite unnecessary accordingly to go back upon ground already traversed, and I will confine myself to noticing very briefly its new developments of the past year.

At Christmas 1892, Mr. Coles, our map curator, gave two lectures to an audience largely composed of young people, which were very well attended. On January 20th, 1893, Mr. Mackinder began a series of geographical lectures in this theatre, addressing himself chiefly to persons engaged in teaching geography. He continued these on the ten successive Fridays, taking as his subjects:—

The Relations of Geography to History.
The Roads to the Indies.
The Belt of Desert and Steppe.
The Gates of India and China.
The Approaches to Europe.
The History of Russia as a Commentary on its Geography.
The Alps as a Factor in European History.
The Approaches to Italy.
The Divisions of Gaul.
Some Geographical Analyses of British History.

Fellows of the Society were admitted free of charge, and could obtain tickets for members of their families at a fee of five shillings for each course.

The lectures were listened to by large audiences. At their conclusion Mr. Dyason moved and Mr. Fitch seconded a vote of thanks, which, proceeding as it did from the initiative of two gentlemen who speak with such authority upon educational matters, was of real importance.

Mr. Mackinder's work at Oxford continues to bring forth good fruit,

and has been recognised by the authorities there in a manner highly gratifying to himself as well as agreeable to our Society, by showing that its choice of a representative at Oxford has fallen upon a man of real merit.

Mr. Buchanan has continued his lectures at Cambridge, though I regret to say he has retired from the post. We hear from the Victoria University that Mr. Yule Oldham, whose appointment was the result of some communications to which I alluded last year, has been doing extremely well at Manchester in connection with the Geographical Society of that place and with ourselves.

Our sister Society of Liverpool, which started under the best auspices only last year, has had a pitiable loss in the premature death of its President, Lord Derby. His solicitors have intimated to us that he has left to the Royal Geographical Society a sum of £1000, an aid to our work agreeable in itself, but more agreeable in that it conveys the approbation of one of the best informed men, and, as I venture to think, far the wisest statesman who has taken part in the affairs of this Empire during the last thirty years.

Mr. Grundy, the first scholar we appointed in concert with the University of Oxford, made Greece the scene of his explorations. He surveyed, *inter alia*, the fields of Platæa and of Leuctra; but was prevented by extremely bad weather from doing a good deal that he intended. He proposes, however, to return and complete his work.

It will be gratifying to many to learn that so far as his researches at Platæa have hitherto gone, they have confirmed the accuracy of the "Father of History."

The studentship instituted by our Society and the University of Oxford, has been given to Mr. Cozens-Hardy of New College, who has taken the Eastern frontiers of Montenegro for his field of study, and, as I hope, of fame. He has already some acquaintance with that country, and may be expected to bring back a good deal of new knowledge.

I mentioned in my last address that we were in correspondence with the Scotch Education Department about the best means of encouraging geography in the Scotch Training Colleges, and it has been settled that we are to award prizes on the basis of the entrance examinations of pupil teachers; this arrangement being considered to be the most convenient by those who direct these institutions.

The Year's Exploration.

In reviewing the work of the Society during the year—the work done at our ordinary meetings and the varied contents of our monthly journal—I have had, to some extent, to deal with the exploring activity of the past twelve months. Still there is much to refer to in order to give a fairly complete *resumé* of what has been done by exploring expeditions

to fill up the gaps in our maps, and of geographical activity in other directions. With this part of my subject I must deal briefly.

In connection with Mr. Markham's Paper I have referred to the fact that the past year was the fourth centenary of the discovery of America by Columbus. This epoch-making event was celebrated in various European countries, more especially in Spain and Genoa, where during the summer and autumn there was a continuous series of *fêtes*, congresses, and exhibitions. In other countries the occasion was commemorated in various ways. America also, in October last, manifested her sense of the importance of an event which initiated her remarkable career, but has reserved until the present year a much fuller recognition in the great exhibition at Chicago, which was opened in the beginning of May, and which in some respects will be the most remarkable exhibition the world has seen.

An event of considerable geographical importance is the completion, during the year, of the remeasurement of an arc of meridian decided on in France in 1869, and instituted after the war of 1870. The work included a variety of operations. It is now practically finished, and the French triangulation is connected by actual observation with the surveys of England and of Spain.

Dr. Schlichter's new photographic arrangement for taking celestial observations has been completed during the year. Its practicability has yet to be tested by actual work. This may be done by Mr. Campbell, who has taken a camera with him to Korea, where he intends to make another effort to reach the lake on the Great White Mountain.

Turning to the exploring work of the year, let us begin with the regions around the Poles. It was hoped that Lieutenant Peary would have come to England about this date, and given us an account of his interesting expedition to the north coast of Greenland from McCormick Bay by land. Unfortunately, he has had to give up his visit to Europe. His journey over the ice of the interior revealed somewhat the same conditions as were seen by himself on his former journey into the interior, and by Nansen when he crossed the ice-bound land. Lieutenant Peary reached the north coast to the south-east of the furthest point attained by Beaumont, and has thus confirmed the conjecture that that coast trends to the south-east. Lieutenant Peary contemplates another expedition to the same coast, partly with a view of further exploring it, and partly for the purpose of making it the point of departure for an attempt to push northwards. No precise date, however, seems to have been fixed for his departure.

Reference has already been made to Nansen's hazardous attempt to reach the Pole. Meantime, as I have already stated, Mr. Frederick Jackson, a young Englishman fired by the example of Nansen and Peary, has brought before the public a scheme for

pushing on to the Pole by Franz Josef Land. To this I have already referred.

Lieutenant Ryder's expedition to East Greenland, which returned to Denmark during the year, made important additions to our knowledge of that inhospitable coast, on which, as will be seen from the map published in the *Proceedings*, he discovered a magnificent series of fjörds.

An interesting attempt, partly supported by the Society and by Mr. Leigh Smith, was made in the past year to add to our knowledge of the Antarctic. Four Dundee steam-whalers were equipped and sent to seek for whales and seals in the South Polar region. On board of them were three young men well qualified and well equipped to carry out scientific and geographical observations. The ships have just arrived, and detailed reports may be daily expected of what has been done for science. But as they did not reach far south, and as the skippers were more bent on seals than on science, it is to be feared that the harvest for geography will be somewhat disappointing.

Coming to Asia, I need only refer to the excellent work which continues to be accomplished by our Indian Survey, a report of which for the past year will be given in the August number of the *Journal*.

In dealing with the activity of the Society during the past session I have referred to the excellent work done by Mr. Conway and his companions in the region popularly known as the Karakoram; his expedition is an example of the kind of careful and minute work that now remains to be done over much of Asia, as of Africa and South America, where what we may call pioneer work has laid down the general features. A good example of the pioneer work is afforded by Captain Bower's journey, already dealt with.

In the summer of last year the Central Himalayas was the scene of an expedition under Dr. Diener, who was accompanied by Messrs. Griesbach and Middlemiss of the Indian Geological Survey. Naini-Tal was the starting-point, and the party penetrated as far as the little-known district of Hundes (Tibet) by way of the Kiangur and Khiogar Chaldu Passes, each over 17,000 feet. Several peaks were ascended, including Kungribingri (19,170 feet).

In Annam an excellent piece of survey work was accomplished last year by Dr. A. Yerzin in the course of a journey from the Coast of Annam to the Mekong, across a hitherto unknown tract of country.

In the Eastern Caucasus last summer Herr Merzbacher did good work in exploring the lofty and comparatively isolated Tebulos and Bogos groups which separate Daghestan from the country of the Chevsurs and Tushets in the south, and the Bogos range in Daghestan. He ascended about a dozen lofty peaks, including Ararat.

As in past years, Africa continues to bulk more largely than any other continent in the summary of the year's exploring work.

I have already referred to Captain Lugard's work in Central Africa, but for the sake of completeness let me repeat that during the expeditions which he conducted from Uganda as a centre, and from which he returned during the past year, he did much to add to and give precision to our knowledge of the whole region.

In the summer of last year an expedition left England for East Africa of which much is expected. It is under the leadership of Mr Astor Chanler, a wealthy young American, who, while fond of sport, has a real interest in exploration. He is accompanied by an Austrian officer, Lieutenant Von Höhnel, who has already done good service in the region to the east and north-east of Lake Victoria. From information which has reached us, the expedition has already done valuable work in the region to the east of Mount Kenia, watered by the Tana River, and is now probably pushing its way into the region lying to the north of Kenia.

The expedition to the Jub River, associated with the name of Lieutenant C. H. Villiers, and from which much was expected, unfortunately fell to pieces before it was well under way. Fortunately, one of its members, Mr. J. W. Gregory, of the Geological Department of the British Museum, has determined to do some work before returning home. By the latest news he had proceeded by himself, with only a few natives with him, to Mount Kenia. It is to be hoped he will reach his goal, for so trained a scientific observer must bring back valuable results.

Several rumours have come out of the darkness which still hangs over Central Africa as to the death of Emin Pasha. No precise information has yet reached us, and Emin has been so often slain that until more positive evidence comes to hand, we must hope that he is still alive. When last heard of he was making his way through the Ituri forests towards either the Congo or the Cameroons. As far as Lake Albert, Emin was accompanied by Dr. Stuhlmann, a qualified scientific observer, and the account which he has contributed of their joint travels and of his own observations on his return journey to Lake Victoria, form valuable contributions to the hydrography more especially of the great inter-lake region. Even more important have been the journeys of Dr. Baumann on the south-east and east of Lake Victoria. Here he has been able to place upon our maps a new and interesting lake, adduce evidences of volcanic activity, and fill in considerable gaps in our knowledge of a region having many interests. Dr. Baumann is an admirable example of the thoroughly-trained scientific explorer. Equally fruitful in results has been the journey which Dr. Baumann has accomplished between Victoria Nyanza and Tanganyika,

the first time such a journey has been made. From the north end of the lake Dr. Baumann proceeded south-east to the station of Tabora. Near the source of the Kagera he found a wooded mountain range known as Mesozi a Mivezi, our old friends the "Mountains of the Moon," which forms the watershed between the Nile and the Rufizi, which flows into Lake Tanganyika.

French explorers have been doing excellent work in Africa during the past year. The journey of Captain Monteil is a remarkable one. He entered Africa from Senegal, crossed the great bend of the Niger to Say, entered Sokoto and Bornu, where he was well received, saw Lake Chad and traversed the Sahara to Tripoli. Details of this interesting journey have not yet been published; but Captain Monteil cannot have failed to add considerably to our knowledge of the region on the borders of Lake Chad, which have not been visited by Europeans for many years.

Another French explorer, M. Maistre, starting from the Congo, and taking a route to the east of that of the unfortunate Crampel, passed through Bagirmi and reached the River Shari, coming out by the Binue and Niger. He also struck new or little-known ground, and the full report of his expedition will be looked for with interest. M. Maistre followed in the tracks of M. Dybovski, who went out to trace the remains of the Crampel expedition, and who also reached the upper course of the Shari. Through all the region M. Maistre searched in vain for Lake Liba, which has so long found a place in our maps.

Great interest has been excited in geographical circles during the past year by the extensive journeys accomplished by the expeditions sent out by the Katanga Company into the Congo Free State. They were under the command of M. Delcommune, M. Bia, and Captain Stairs. Generally, it may be said, they have resulted in most important additions to a knowledge of the hydrography of the extensive region watered by the great rivers that contribute to the formation of the Congo, the Luapula, the Lualaba, and their numerous affluents, as well as of the lakes that mark their course. Unfortunately the work cost the lives of, among others, Captain Bia and Captain Stairs.

Further north, another life has been sacrificed to the enterprise of the Congo Free State, that of M. Van den Kerckhoven, the leader of a great expedition to the Upper Nile, about whose aims and work we are, however, very ignorant. In another part of Africa the famous French explorer, Captain Binger, has added to the services already rendered by exploring the Gold Coast interior from Bonduku to Kong. In German South-west Africa, Count Pfeil accomplished a journey, during the past year, from the Orange River on the south, through the east and the centre of Namaqualand and Damaraland, during which, as a trained scientific observer, he was able to add much to what we know already of the geography and capabilities of the country. The results of Count Pfeil's

journey will be given in an early number of the *Journal*. The Germans have also been continuing the work of exploration in the Cameroons, though that colony does not seem to be progressing as satisfactorily as might be wished.

Major Leverson and Senhor Ennes, the English and Portuguese deputies for the delimitation of the territories of the British South Africa Company and those claimed by Portugal, have completed their work. The result has been the careful exploration and mapping of a strip of land some portions of which were quite unknown. The result of this will be given in an early number of the *Journal*.

Mr. Selous has told us of his own recent work in Mashonaland. The Company's surveyors and pioneers are continually adding others, and during the year not a few of the meshes in the network of pioneer routes have been filled up.

Mr. Joseph Thomson's important journey across the plateau between Lakes Nyasa and Tanganyika was supplemented during the past year by a journey made by Mr. Sharpe (one of Mr. H. H. Johnston's Vice-Consuls) from Lake Nyasa to Lake Tanganyika, and thence to Lake Mweru and the capital of Cazembe. Mr. Sharpe has rectified our knowledge of the lake and added some fresh information concerning the region which surrounds it. In other directions Mr. Johnston and his staff have been increasing our knowledge of the region which he administers. One member of his staff, Lieutenant Sclater, has just returned to England, after having nearly completed a road from the Lower to the Upper Shiré.

Mr. Theodore Bent's expedition to Abyssinia for the purpose of investigating the ruins of Axsum has not been so successful as might have been wished, owing to the hostilities which are being carried on between two of the chiefs; indeed, he and Mrs. Bent had a narrow escape from being involved in their hostilities. Still, the expedition has not been altogether without interesting results.

Mr. Cecil Rhodes's great scheme of a Central Africa telegraph from the Cape to Cairo is a project of some interest to geographers. It may be recalled that a similar scheme was brought before the Society some fifteen years ago, and that the late Colonel Grant took much interest in it.

A controversy has been carried on during the year under review between Dr. Schlichter and Mr. Swan (Mr. Bent's companion in Mashonaland), with reference to the astronomical relations and symbolical significance of the famous Zimbabwe ruins. The general conclusion to be drawn is that we want more details and more precise information before we are justified in building any theories on these remarkable remains.

In South America valuable contributions have been made during the year to a knowledge both of the lowlands and highlands of Ecuador by

Dr. Wolf, who acted for some years as government geologist in that country.

Considerable additions have been made to our knowledge of Patagonia by Dr. Siemiradzki, whose maps and narratives have only quite recently been issued at Gotha. These fill up a large blank in a country which, though it has been the field of official expeditions, still is very imperfectly known.

In Australia we have had the results of the expedition to the centre of the continent, sent out by Sir Thomas Elder, under Mr. Lindsay. Although the expedition was a failure on the whole, still it is evident from the maps and reports that something was done to fill up the great blank which still remains. Mr. Guy Boothby, himself a native of Australia, has just arrived in this country, after having crossed the continent from the north of York Peninsula, down through Queensland into Victoria. It remains to be seen whether Mr. Boothby has achieved any original results.

In New Guinea and the neighbouring islands, the administrator, Sir William Macgregor, continues to occupy himself busily in acquiring a knowledge of the geography and resources of the region under his care. His last annual report is as voluminous and instructive as usual.

I am indebted to the Hydrographer, Captain W. J. L. Wharton, for the following summary of the admirable work accomplished by the Admiralty during the year:

Admiralty Surveys.

Under the orders of the Lords Commissioners of the Admiralty there have been employed in hydrographical surveys in various parts of the world seven steam-vessels of war and two hired vessels, with crews consisting of sixty-six officers and six hundred and twenty-seven men. Under the Government of India there has been one steam-vessel employed on the coasts and dependencies of India; while a small steam-vessel under the orders of the Dominion Government of Canada has been engaged on the inland waters adjacent to Canada.

The several localities where these surveying vessels have been actively engaged are as follows:—The shores of Great Britain and Ireland, Nova Scotia, Anticosti Island; Africa, east coast; Greece, west coast; China; Borneo, Australia, and the New Hebrides. A full report of the work executed by each vessel has been presented to Parliament in accordance with annual custom; but the following is a summary of what has been accomplished:—

On the shores of Great Britain, a re-survey of Southampton Water on a large scale was commenced and completed. An examination was made of the Shipwash and other shoals in the approach to Harwich, and the result proved that considerable changes had taken place in the position and depth of water on most of the shoals examined, the tendency of the outer shoals being to extend to the north-eastward. In the North Sea, off the Humber, an area of 242 square miles to the northward of that portion completed during 1890 and previous years was well sounded out, but no shoals or dangers to navigation were discovered. A survey of Bridlington Bay revealed the fact that great alterations had taken place on Smithic Shoal; the

greater portion of the northern part has been washed away, while the southern part is much shoaler. In the Thames, an examination of the Shingles Patch in the Duke of Edinburgh Channel showed that the depth on it had decreased 3 feet since the last examination in April 1891.

At the northern entrance to Menai Strait, the shoals and channels at the head of Beaumaris Bay were re-surveyed, and considerable alterations found to have taken place since the previous survey in 1872. The southern portion of Carnarvon Bay was sounded out to the 30 fathoms contour, and the southern entrance to the Menai Strait completely surveyed.

On the west coast of Scotland, Kerrera Sound and the north approach to Oban were surveyed on a scale of 10 inches to the mile, completing the work commenced in the previous year.

Off the north coast of Ireland, a large area was examined with a view of obtaining more detailed knowledge of the depths off the coast, so as to form a guide in thick weather to shipping approaching the Irish Channel from seaward. No dangers to navigation were discovered, but several inequalities of the bottom that might much deceive a shipmaster as to his position were charted.

The work on foreign and colonial shores has been as follows:—

In Nova Scotia, the outer part of Halifax Harbour with its approaches was surveyed, and though no new dangers were discovered, yet the known shoals were found to have less water over them than hitherto shown on the charts. A fisherman of Newfoundland having reported the existence of a shoal patch off Cape Race, an examination of the spot was made, when the least water found on this shoal—called Nickerson Bank—was 10½ fathoms, the position being 17¾ miles west-south-west of Cape Race lighthouse.

A survey of the east coast of Anticosti Island was taken in hand in consequence of frequent reports that dangers extended farther from the shore than marked on the charts. About fourteen weeks were spent in a detailed survey extending from Table Head round the east point to Jupiter River, a distance of 56 miles: but the result proved that the dangers, instead of being farther off shore, are not so far as charted.

The survey of the coasts of the British East African territories was continued from the work of the preceding season, and completed from Ras Ngomeni to Lamu Bay. A plan of Lamu bar and harbour was also made.

The difference of longitude between Aden and Perim was determined by means of the electric telegraph, and a search made for a shoal in the northern entrance to the Massawa Channel on which the S.S. *King Arthur* is reported to have struck, but without finding any danger.

On the west coast of Greece a detailed survey was made of that much indented shore-line with off-lying islands between Scropha Point at the entrance to Patras Gulf and Astoko in Dragomesti Bay. A plan of the harbours of Pandelomona and Platea was also executed. During the progress of this survey a dangerous pinnacle rock (now called Day Rock) standing in 20 fathoms with only 26 feet of water over it, was discovered in the fairway off Port Platea, and it is fortunate that none of our deep-draught ironclads have struck it when making use of this channel.

In the China Sea, a careful search was made for the Hossack shoal in the vicinity of the Pratas. In spite of unpropitious weather, an area of 900 square miles was sounded out as closely as circumstances would permit, but no indications of any such danger as reported could be found.

The Macclesfield bank, a submerged coral atoll lying in the middle of the China Sea, is frequently crossed by vessels on their way from Singapore to Hong Kong.

A vague tradition of dangerously shallow water somewhere on its circumference of 180 miles has existed for many years, and the report by a P & O vessel in 1891 of a shallow cast, caused an examination of it to be ordered. A detailed examination was made of the western half of the rim, and in several places it was found that there was only from 6 to 10 fathoms of water; but the shoalest spot found was on a small coral patch near the centre of the lagoon, which was only covered by 5 fathoms of water.

A series of dredgings were taken nearly every day on the outside slope and inside the rim of this atoll, and the results examined by Dr. Bassett Smith, surgeon of the vessel. His report on the collection of corals, etc., thus obtained has been published by the Hydrographic Department, and the specimens forwarded to the Admiralty have been presented to the British Museum.

The Anamba Islands, a group of which very little is known, lies near the steamship route in the southern end of the China Sea. A detailed survey of them was commenced, but not completed before the close of the outdoor season.

On the north-east coast of British North Borneo, the survey was prosecuted from where it had been discontinued the previous season, and completed from Dent Haven to the boundary between English and Dutch possessions in 4° 10′ north latitude. During the progress of this much-required survey a large number of reefs and small islets were charted, while several dangerous rocks and shoals were also discovered.

On the completion of this work and when passing through the South Banguey Channel, the surveying vessel discovered a small pinnacle of coral in the middle of the fairway with only 10 feet of water over it. Considering that steamers have been using this passage regularly for some years it seems marvellous that a wreck has not taken place on such an unexpected danger.

On the east coast of China the survey of the southern part of the Chusan Archipelago, in continuation of the work done by H.M.S. *Rambler* in 1890, was completed. This survey embraced the whole of the area between the Yung River and the Kueshan Islands, including the western part of the Chusan Islands. Large scale plans of the Yung River and Sheipu Roads were also made. Further observations on the bore of the Tsein Tang Kiang were also made and many photographs taken, but nothing new was ascertained regarding the main features of the phenomenon.

In Australia the detailed examination of the inner passage between the Barrier Reef and Queensland coast was continued between Cape Grenville and Orfordness, and a distance of 65 miles completed. Considering the necessity of a very careful search for the small coral patches which are invisible until close upon them, progress in this survey must necessarily be slow.

In the New Hebrides, the survey was continued from the preceding season's work; the north and east coasts of Mallicolo Island were completed, and also the southern shores of Espiritu Santo; besides plans of Segond Channel, Malo Pass, Baldwin Cove, and Tangoa.

Besides the work done by the regular surveying vessels, the officers of H.M. ships have sent in many sketches and plans of harbours and anchorages which are a great assistance in improving the charts. Deep-sea soundings have also been obtained by the vessels belonging to the various telegraph companies, which greatly improve our knowledge of the formation of the ocean bottoms.

The surveys carried on under the orders of the Indian Government include a survey of the east coast of Hindustan from the central mouth of the Godavari River to False Divi Point, the soundings being carried out to the 100-fathom line, which is on an average 13 miles from the shore; also a plan of Masulipatam Roads. The

Lakadivh Islands were visited, the positions of some of them determined, and surveys made of Cardamum and Ancutta Islands, Detra Par, and Pere Mul Par Reefs.

In Canada the survey of the eastern shores of Georgian Bay, Lake Huron, was continued from Moose Deer Point to Waubaushene, including the Christian Islands. The survey of Parry Sound, which had been commenced the previous season, was also completed.

During the year the Hydrographic Department has published sixty-nine new charts and plans, and ten plates have been improved by the addition of fifteen new plans. One hundred and sixty-two plates have been largely improved by corrections and additions, while 4296 corrections have been made to plates by the engraver.

Obituary of the Year.

Our losses by death, though not so lamentably numerous as last year, have been great enough, as will be seen from the following list:—

Israel Abrahams; John R. Andrews; Henry Mc. L. Backler; John Bartholomew; General Sir Henry Bates, K.C.B.; John Charles Bell; Very Rev. Edward Bickersteth, D.D. (Dean of Lichfield); Frederick W. Bigge; Capt. B. H. H. Birchill; Francis Black; Frederick Elliot Blackstone; Dr. James Bright, M.D.; Capt. A. T. Brooke, R.N.; Dr. Hermann Burmeister (Honorary Corresponding Member); Higford Burr; James Campbell, R.N.; R. Russell Carew; W. C. S. Carmichael; Sir Charles Clifford, Bart.; Major O. Y. Cocks; Augustus Cooper; General S. Wylie Crawford; T. M. Crowder; Lord Deramore; Right Hon. Earl of Derby, K.G., LL.D., D.C.L.; Rev. George de Vitre, M.A.; George Duncan; Sir Thomas William Evans, Bart.; H. W. Freeland; Bartle Jno. Laurie Frere; General Albert Fytche, C.S.I.; Thomas Rannie Grant; Col. George Edward Grover, R.E.; Sir R. W. Harley; Andrew Hay; Augustus Allen Hayes; E. H. Hewett; Alfred Hicks; E. W. Humphreys; F. H. Ward Jackson; H. Berkeley James; R. Castle Jenkins; William Jennings; Hon. W. Nassau Jocelyn, C.B.; Joseph Kips; Andrew James Livingston Learmonth; John Dunkin Lee; Earl of Lichfield; John MacGregor; John Mackinlay; Charles Mallet; Admiral Richard Charles Mayne, C.B.; John H. Morant; D. L. Morgan, C.B. (Inspector-General, R.N.); Philip A. Myburgh; Lieut.-Col. Francis Newdigate (Coldstream Guards); Robert C. Nichols; D. R. Peacock; John Henry Plowes; Samuel Proctor; Captain John Compton Pyne; John Ramsay (of Islay, N.B.); Andrew H. Reed; J. Brinsley Richards; John Lambe Rigden; David Ross; A. V. Nursing Row; John St. Clair; Captain Charles W. Selwyn, M.P.; General Shdanof (Honorary Corresponding Member); Eli Lemon Sheldon; Captain W. G. Stairs; Collard Joseph Stock; General Charles Stuart; The Duke of Sutherland; N. J. R. Swart; Frank Tayler; Dr. A. Boyle Thompson; John Vincent; Hubert Foveaux Weiss; Captain Sir William Wiseman, Bart., R.N.

REPORTS ON GEOGRAPHY AT THE UNIVERSITIES.

To the Council of the Royal Geographical Society.

Oxford, *May 19th*, 1893.

I have given my usual lectures during the past academical year, but have somewhat re-arranged the grouping of subjects. Instead of

devoting half of my lectures in each term to Historical and half to Physical Geography, I have given all my attention in the Michaelmas and Lent Terms to the students in the History School, reserving the Summer Term for students of Natural Science. The effect has been to secure a large class for two-thirds of my lectures in place of half.

The attendance of graduates and undergraduates reading for honours in Modern History was as follows: In Michaelmas Term, sixty-one men from fifteen colleges; in Lent Term, forty-four men from eleven colleges. In addition, there were in Michaelmas Term, twenty-six lady students from three halls; in Lent Term, eighteen from three halls. These attendances are considerably larger than any which I have yet been able to record, and they become the more encouraging when it is remembered that the lectures were delivered twice a week instead of once, as in previous years.

I regret to say that as yet there is no similar increase in the demand for Physical Geography. I have only had the opportunity of giving a little instruction in that subject to one undergraduate and two or three ladies.

It is a great pleasure to be able to report the successful efforts of a colleague in the geographical field. During the present term Mr. Hogarth, of Magdalen College, has delivered a few lectures introductory to Ancient Geography, and they have been largely attended.

Altogether I feel justified in saying that there are indications of a drift of thought towards the geographical side of several of the subjects studied at Oxford. I base this opinion not merely on the statistics which I have given, but also on many small observations, individually of too little importance to be enumerated here.

I have received, as additions to our apparatus, from the Berlin Geographical Society a copy, in sheet, of Kretschmer's great atlas; and from the United States Geological Survey nearly one hundred maps of different types.

In March the Electors appointed to the University Geographical Studentship for the current year Mr. W. H. Cozens-Hardy, B.A., of New College. Mr. Hardy will devote his investigations to portions of Montenegro and Albania. He has already travelled in neighbouring districts, and has the great advantage of speaking the Serb language. The student of 1892, Mr. G. B. Grundy of Brasenose College, has done some good work in Boeotia. I believe that his report and maps will shortly be published by the Society. It may not be out of place to mention the fact that Mr. Grundy has recently been appointed to the head-mastership of the Oxford Military College at Cowley.

In company with Dr. Mill, I again examined in geography for the commercial and lower certificates of the Oxford and Cambridge Board. There was a marked improvement in the work done for the former, and many indications of more careful teaching.

Turning now to the geographical teaching which I have been able to give outside Oxford, I have to report, in the first place, eighteen lectures at Winchester, Southampton, and Lyndhurst in connection with the Oxford University Extension. This is but a small remnant of the work of this kind which I did in former years; but I am happy to say that other lecturers are already coming forward to take my place.

At the Reading University Extension College I have had the opportunity of superintending classes for pupil and assistant teachers, and so learning the conditions of geographical instruction in a most important department of our national system of education.

Lastly, in January, February, and March I gave in London the course of educational lectures recently instituted by the Society. My subject was "The Relations of Geography to History in Europe and Asia." The audience consisted of about two hundred persons, mostly teachers of various grades, who attended the whole course with the utmost regularity. Though no examination was held to test results, I have reason to believe that the students grasped the ideas which it was attempted to convey to them, and that as they came from all parts of London, the effects of the Society's action were probably felt by a large number of pupils not present at the lectures. I should like to mention the great help which I received from Mr. Darbishire in the preparation of the slide-maps, without which the illustration of my lectures would have presented great difficulties.

H. J. Mackinder, M.A., Reader in Geography.

To the Council of the Royal Geographical Society.

Cambridge, *May 7th*, 1893.

The lectures this year have been devoted to *Oceanography*, or the Physical Geography of the Sea. In the first term the subject was treated from a *statical* point of view: particular attention being given to the permanent features, such as the distribution and characteristics of the beds of the oceans and minor seas, and the temperature and climate of their deeper waters, which depend largely on the configuration of their beds. In the second the subject has been approached from the *kinetic* point of view: particular attention being paid to the features of the ocean involving change and motion. It is mainly devoted to oceanic circulation.

In the Michaelmas term the attendance at the lectures was very satisfactory, and one student attended the laboratory for practical work. The attendance in the present term is not so favourable, which is no doubt due to the proximity of the examinations.

The room in the New Museums, which has been fitted up as a geographical laboratory, has already been taken advantage of by one or two students, and continuous work is being done in it by my assistant, Mr. Heawood. When it is better known it is hoped that original work may be produced in it by students, which may merit the bestowal of the prizes provided by the liberality of the Society.

J. Y. BUCHANAN, F.R.S.

To the Council of the Royal Geographical Society.

OWENS COLLEGE, MANCHESTER.
May 25th, 1893.

I beg to submit a report of the results of my first year's work in connection with the geographical lectureship founded here by the Royal Geographical Society in conjunction with the Manchester Geographical Society.

After entering on my duties at Easter in last year, I lectured, until the end of the Summer Term, three times a week, giving a short introductory course, followed by a longer one on the British Empire. These lectures were attended by forty-five students of the Day Training College, to whose requirements they were adapted. Some of the interesting features of the Peak district were also visited.

In the winter I gave a course of ten evening lectures on some of the economic aspects of geography, which sixteen students attended—a good attendance for an evening class.

For the Victoria University Extension I gave thirty-six lectures at the following centres:—Gorton, Leigh, Lytham, Moston, and Withington. All of these were well attended by audiences ranging from one to three hundred. I also gave two courses of six lectures each at the Storey Institute, Lancaster, and University College, Liverpool; and in addition single lectures at several places, including Wolverhampton and Oldham, to audiences exceeding one thousand.

My work has been much hampered by the almost total absence of maps and other necessaries; but, notwithstanding, a fair beginning has been made, the unstinted loan of material belonging to the Manchester Geographical Society having proved of no little value.

I would only add that the indications of the second year's work have so far been promising.

H. YULE OLDHAM, M.A.

SOUTH-WEST AFRICA, ENGLISH AND GERMAN.

(From an economical point of view.)

By JOACHIM COUNT PFEIL.

THE development of a country's resources, commercial or otherwise, depends chiefly upon its physical qualities and its inhabitants, and extends mainly in two directions—the utilisation of the soil, on or below its surface and the vegetation which covers it, or the establishment of trade with the peoples of the country. As the inhabitants of a country are to a very great extent affected by its physical condition, it may be said that on it the establishment of trade in the end depends. As, however, climatic influence is a very slow factor when applied to human beings, we shall not stop to reflect how far traits in the character of our natives may be traceable to it, but merely consider in what measure it modifies our method of dealing with the physical resources of the country. The native we shall treat as a separate factor in the development of the country, and as entirely unconnected with the physical qualities of the latter.

My journey (which was made in 1892) began at Port Nolloth, a little place on the west coast of Africa, in about 29° 18′ S. lat. I then went to the little mining town of Ookiep, and proceeded thence nearly northward to the Orange River. I then proceeded nearly east, parallel with the river, but some little distance south of it, till I turned north again and crossed it at a place called Schuitdrift, or "Stolzenfels." The former name signifies a ford, which is crossed by means of punts; the latter is the name of a famous castle on the Rhine, and has been given to the place by a German settler, who owns a large tract of country near the "Drift."

From the river I proceeded in a north-easterly direction until I reached "Burghers Dam," 19° 38′ E. long., from which place I turned south-east to pay a visit to the little town of Upington. I returned to Burghers Dam and then went north and north-west until I reached the German settlement of Windhoek, Jonker Africander's former stronghold, which is situated in about 22° 35′ S. lat. I then turned west, and proceeded in a nearly straight line to the mouth of the River Swakob, and from Walfisch Bay I returned to Cape Town by sea.

The country I traversed varies considerably when looked upon with respect to its development. The sportsman or tourist would probably complain of its monotonous aspect and its apparent want of water and vegetation.

Port Nolloth ought not to be called a harbour. It is merely an open "offing," which only affords anchorage at considerable distance from the coast, and hardly any protection from the prevailing winds. All

loading of vessels has to be effected by means of lighters in fair weather, and becomes quite impossible when the south-west wind blows hard. There are but few houses in Port Nolloth; they form one side of the only street in the place. On the other side, and at the back of the houses, begins the deep desert sand. This belt of sand extends all along the coast, and may be looked upon as the beginning of a zone of arid territory which trends northward, assumes much broader dimensions on the northern banks of the Orange River, and an almost terrible extent and character much farther north. The Swakob River may be called the northern boundary of this belt of sand, though even beyond this a good deal of arid country is still met with. What chances for utilisation the Kaoko, the district which now follows in the north, offers we do not yet know.

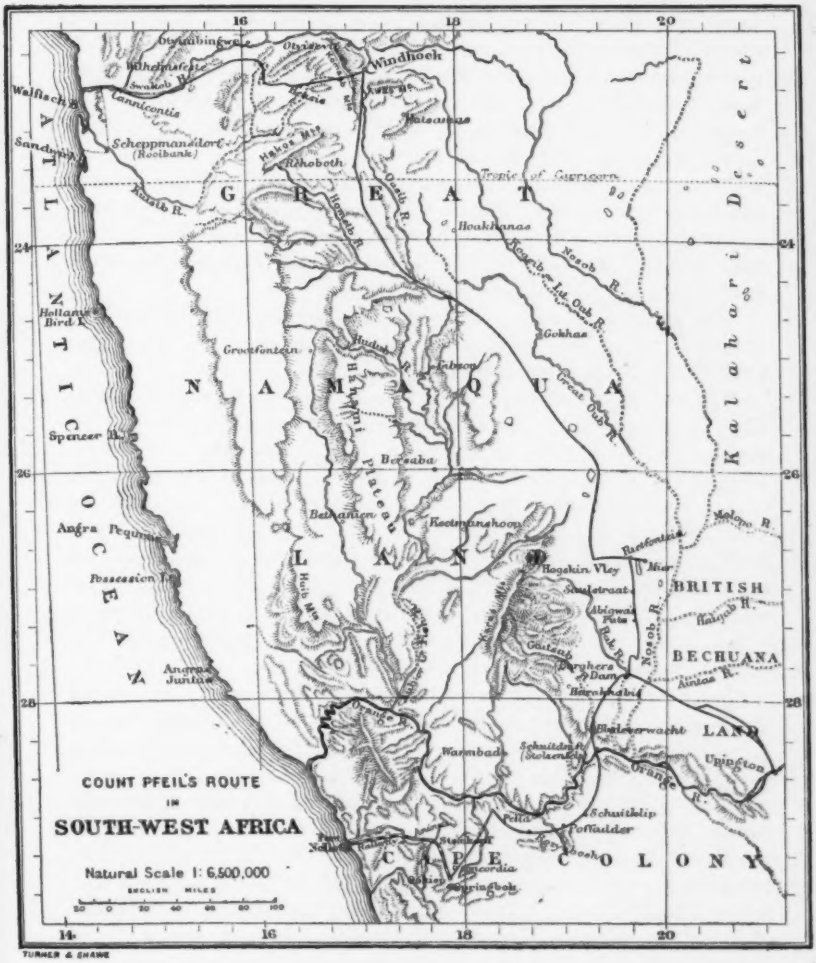
In former years the country about Port Nolloth did not offend the eye by its nakedness. What is now loose sand was then much firmer, and covered with little bushes called "Veigebosjes" in the Cape dialect. The opening of the Ookiep mine called considerable traffic into life, and great numbers of ox-waggons, accompanied by the necessary natives, daily passed between the two places. These natives uprooted all the little bushes round Port Nolloth for miles to use them as fuel, of which there was no other supply. The soil was thus denuded of its protecting cover, and sun and wind dried up the surface, which, unable to retain moisture, could no longer develop the germ of life in the seeds which still remained, or in those which found their way there.

As the process of denudation spread wider, desiccation penetrated deeper and killed the remaining roots, which might otherwise have replaced the former growth. What had formerly been a very light soil, was turned into worthless sand and became subject to the action of wind and tide. Once set in motion by both these agencies, it began to encroach on its surroundings, and soon silted up what had formerly been a clear rocky beach. This is proved by the fact that a jetty built out into the sea is now almost swallowed up by the sand, whereas in former years a man on horseback could cross under it at full speed. Since the building of the narrow gauge railway which connects Port Nolloth and Ookiep, the waggon traffic has disappeared, and with it the natives who destroyed the bushes. There seems, however, to be no chance that the latter should reappear.

The managers of the mining camp very kindly placed a so-called "special" at my service, and in this very comfortable little carriage I proceeded inland. A drive of very few miles took me out of the sand into a region showing a gradually-increasing vegetation, which, when we had nearly ascended, the Ookiep plateau merged into one of the grandest sights that can delight the senses of the travelling naturalist.

The scenery near Klipfontein is rugged and picturesque. Trees there are hardly any; but the whole country was at that time of year

(in June) covered with a multitude of flowers, the golden-red colour of which prevailed to such an extent that only where human labour had destroyed the gorgeous covering, or where the bare hard rock had repulsed the embellishing hand of nature, green and grey tints showed



the colour of the garment, on which the flowers worked the most graceful embroidery. A lovely scent, like that of a cottager's little garden, filled the air, which was alive with the hum of wild bees. From what an old settler in this place told me, it would seem that in

different seasons of the year different flowers appear; so that had I come earlier or later, I might have seen the hills covered by a carpet of a white or bluish hue, instead of the golden-red which now delighted my heart and charmed my senses.

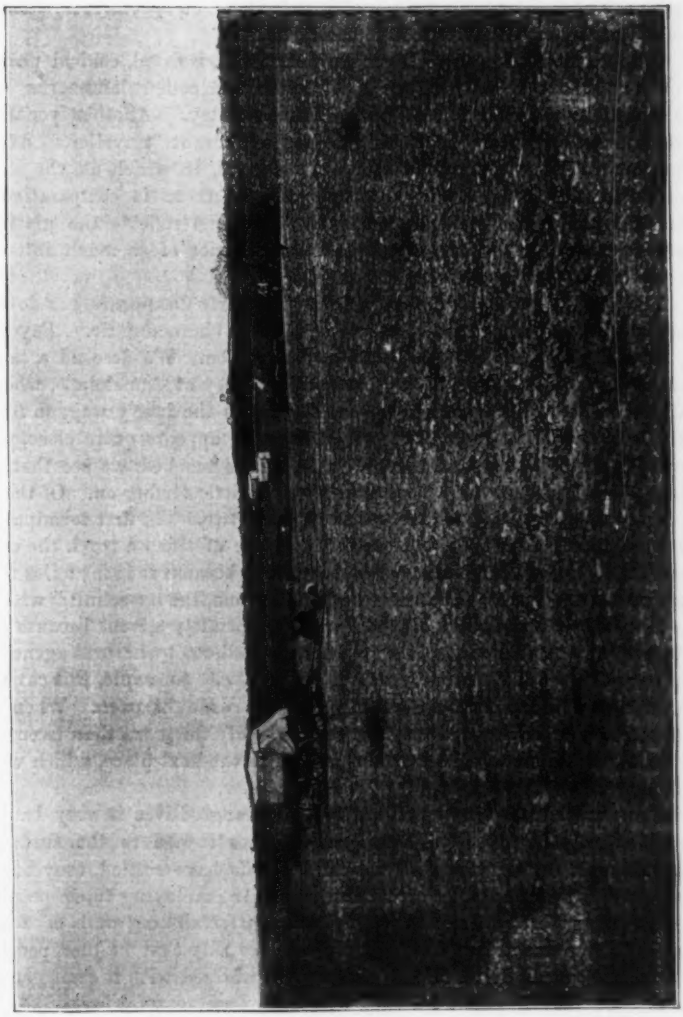
At a place called "Aninus" we had left our engine and train and harnessed six mules to our "special" without suffering a diminution of speed. Many curves and some bold viaducts led us to the top of the plateau, which we reached at Steinkopf at an elevation of about 3000 feet. Vegetation grows scarce again, and water, of which we had seen a small rill here and there among the hills, seems to disappear entirely. A student of geology would find this part of the country very interesting, and, perhaps, still more puzzling. All our ideas of strata and layers seem to be at fault here. I had no chance to stop in order to examine some of the cases; but had a general impression that the usual order of things is entirely subverted, and the oldest formations are found on top of more recent ones.

The scarcity of water continues, and even at Ookiep there is no natural supply; but the water is brought into the place from some considerable distance by means of pipes.

The miners of Ookiep are too well known to require notice. They have been the means of developing the surrounding part of the country, which, without them, would, in all probability, still be the home of wild game and still wilder bushmen, neither of which are now often met with. One fact alone deserves notice. Although all victuals—with the exception of meat—have to be brought from Cape-town, and command very high prices on account of the great distance and difficulty of transport, yet has no one in the neighbourhood attempted to grow vegetables or grain of any kind. The good prices which could be realised for products of all kinds make the fact that they are not being produced all the more remarkable.

The Boer farmer is no agriculturist; but this does not account for the want of agriculture. English farmers would readily till the ground could they see their way to make it pay. Even if we admit that their attention has not been directed to this part of the country yet, it would appear strange if the clear-sighted manager of the mine had not recognised and tried to relieve the want. The only reason we can find is, that it probably cannot be carried on. There is, it is true, but little water—hardly enough to serve for irrigation purposes, and not a sufficient rainfall, it seems, to make agriculture independent of irrigation. Furthermore, the soil appears to be very poor, and the country so rugged, that only in very few places an area large and level enough to invite cultivation might be found.

Going north we find that the country changes. It grows more level, and the rugged broken hills give way to solitary round hillocks, or low connected ranges. These are perfectly bare of vegetation, and



A FARM IN NAMAQUALAND.

the red colour of the gneiss, of which they are composed, imparts a peculiar character and fine desert tints to the otherwise uninviting landscape. The deep sand prevents a rich vegetation, and only allows a scanty growth of grass tufts which, in spite of being coarse and hard, supply amply a favourite food to the cattle.

On nearing the Orange River we notice tall, isolated, conical peaks, of very bright deep-black basalt. They form excellent landmarks, but seem to be confined to this part of the country. Another peculiar feature of the landscape strikes the observant traveller. After leaving Wortel we pass a rather hilly district, in which all the hills are almost entirely composed of quartz. As there is comparatively little vegetation, the white colour of the stone reflects the glaring sunlight and dazzles the eye, which soon wearies of so much intense brightness.

Shortly before reaching Rozynbosh the quartz disappears, nor do we see much of it again as a distinguishing characteristic. Beyond Rozynbosh another feature claims our attention. We descend a long slope, and reach the bottom of a shallow valley at Annakoppe, where the ascent of the other side begins. For hours the heavy waggon toils through the deep sand. The end of the rise appears quite close, yet when the spot where we expected to find it is reached, we see that it is again quite near to us, but still again a little farther on. Of these immensely wide, shallow depressions we have two. The first terminates at Poffadder, behind which the second begins; of this we reach the end at Schuitklip, which is an outspanning place, because it is for miles the only water-reservoir. The name signifies a stone like a "schuit," which is Dutch for "large boat." It is very appropriately given, because in the stone at this place a hole has been hollowed out by natural agencies exactly like a boat of very old-fashioned shape. As a rule, this cavity contains sufficient rain-water to water the draught oxen. When I passed it there was none, and my oxen, already for more than twenty-four hours without water, had to push on to the next place, which was more than ten hours distant.

The part of the country adjoining the Orange River is very badly supplied with water. Hardly anywhere does it rise to the surface, and at most of the places where white people have settled, they have been obliged to raise it by artificial means. In employing these, people have often suffered disappointment; when, after sinking wells of some depth, water was at last reached, it proved so salt that neither people nor animals could drink it, and plants when watered with it commenced to droop.

The whole country seems to be impregnated with kali. The estuaries of the Orange River are so filled with it that in many places their beds present the appearance of being covered with snow. Though perfectly dry, they sometimes contain a little water, which is intensely

bitter and salt. I was told of a pure saline spring, but could not fix its precise locality.

From the comparatively level country through which we had been travelling hitherto, we descended into the Orange River valley, which gives the impression as though an immense volume of water, sweeping across the country at a terrific rate, had worked out a deep ravine along its course, carrying away all the softer portions of the soil, and only leaving the harder parts, formed of quartz and archaic rocks, which now stand about in chaotic disorder, and sometimes assume very grotesque shapes and possess considerable height. Since the time when the country produced so much water that it could part with quantities sufficient to erode a valley like the one before us, it seems to have undergone a process of steady and continuous desiccation; for the mean, muddy, and shallow stream which lazily winds its way at the bottom of the valley looks too insignificant to be credited with all the work of destruction of which this region bears indelible marks. During the long distance the river travels without receiving any addition to its volume, it parts with so much water through the process of evaporation that in the dwindled streamlet it is hardly possible to recognise the noble, broad, and clear river of the eastern and mountainous part of the Cape Colony. The hills, whose material was hard enough to resist the force of the rushing water, are permeated by bands of quartz, here called reefs. They lead to the conclusion that gold or other valuable minerals ought to be found in this district, and traces were undoubtedly discovered of such, not, however, in payable quantities.

On leaving the river, we traverse a more or less broken country, and pass a place called Blydeverwacht, remarkable for the possession of a fine open spring which, by missionaries, the former settlers in this place, was led out for irrigation purposes, and then we immediately begin to ascend the plateau of which the precipitous side had been visible for miles ere the Orange River was reached.

The Gaitsab River rises on this plateau and through a deep gap descends to the Orange. In the dry river-bed the road has been laid, and between almost perpendicular walls of limestone, which has become altered in its upper and almost perfectly level layers, we travel till a high elevation has been obtained. We have now entered a perfectly different country. A wide undulating plain extends before us, which is chiefly covered with grass. There is hardly any water, and what there is has been obtained by digging for it, or by damming it up. Only in one place, Heirakhabis, an Englishman has succeeded in turning a rather plentiful supply of it to account, and in producing various kinds of grain by means of irrigation. At most other places, the water-supply serves only for watering cattle, goats, and a very few sheep. For agriculture the supply is insufficient, or could only be obtained at an expense too great to make it profitable.

After about a day's travelling on the plateau, we reach the so-called downs. These are a very remarkable feature of the country, and not at all satisfactorily accounted for yet.

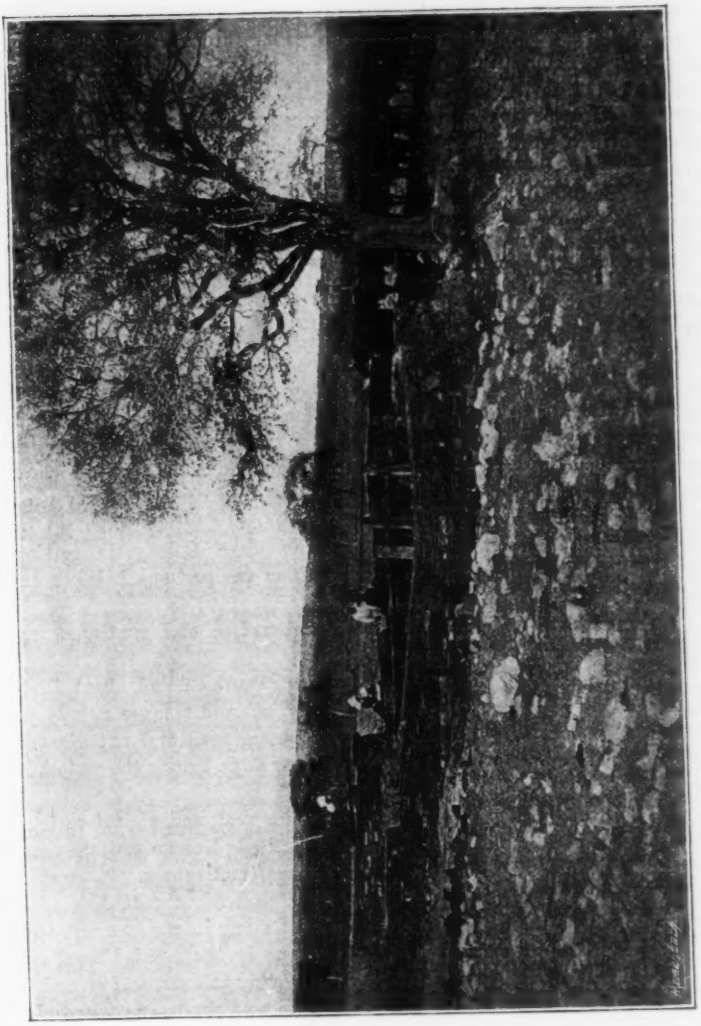
It seems that the soil in certain parts of the plateau shows a tendency to turn to sand. The prevailing winds sweep the country of it and pile it up in long parallel ridges which, almost without exception, run north-west to south-east. In some places they reach an appalling height, and their sides are so steep that an ascent in rectangular direction to the length of the down is simply impossible. These downs, or ridges, follow each other in quick succession and are a curse to the traveller and to his cattle.

Why we should find the downs in one spot and not in another, where there is hardly a change in soil or vegetation, is very curious; yet there is always a varying number of the sand ridges following closely upon one another, and then a stretch of level country again, which allows a rest for man and beast.

A district in which downs prevail is generally perfectly arid. Not a drop of water is met with for miles, and all animal life retires from a region in which even human effort is unable to procure this first necessity of sustaining it. No one voluntarily leaves the beaten track in the "downveld"; the great sameness of aspect is terribly confusing, and only a pure-bred Bushman possesses enough sense of locality to find his way back to camp when once he has wandered among the downs. Yet, strange contrast, these parts, though entirely unredeemable from their desert character, offer unlimited first-class pasturage. Though no water could be found, even if searched for at considerable depth, yet the loose sand contains a considerable amount of moisture which gives life to the so-called "Toa grass," than which nothing is better for giving sleek skins to and keeping in capital condition the farmers' cattle.

This fact, easily noticeable by turning over a spadeful of the sand, is probably due to the capillarity of the latter, and is highly appreciated by the farmers, who, when their farms are grazed off (and this frequently happens in dry years), simply drive their cattle into the downs, where they stay until thirst compels them to return to the spring on the farm It is wonderful how long animals can remain without water. A man who had just crossed the Kalahari from Kuruman to Rietfontein related that his oxen had to travel ten days without water; they pulled in the yoke all the time, yet none died. Horses travel four days without water, but only three when required to work at the same time; sheep and goats when travelling must have water every third day.

Another peculiarity we find in this sand district. It is the so-called "straate" or long stretches of hard ground, almost resembling a threshing-floor, and covered with coarse gravel. These places are



WELL ON THE FARM.

devoid of the least sign of vegetation, and sometimes, as for instance at "Saulstraat," have very considerable dimensions. In the midst of these downs at the "Bakrevier," though no one would suspect that the slight depression in the sand was the bed of a river, the migrating farmers have made a dam which holds water through the greater part of the year. Here I rested my oxen, and with a cart and four horses paid a visit to Upington, which is situated on the Orange River. The district I traversed is very poor, partly very stony, partly deep sand, everywhere very dry. Knowing of the vicinity of the Kalahari desert one has the distinct impression of travelling along its border, and the long ridges of red sand which have to be crossed at intervals appear like feelers or arms of a large octopod, which hugs and saps to death all life-bearing creatures that come within its irresistible grasp. This part of the country, being almost absolutely worthless, offers but scanty subsistence to the herds of "trecking" Boers, *i.e.*, Dutch farmers who, having no ground of their own, lead a nomadic life in what may be practically called the desert. Few have bought large tracks of land from Government, but they require often 10 acres for each head of horned cattle, and even then they are often obliged to move when their water supply gives out. In Upington the river supplies enough water to irrigate portions of the fertile deposits on its banks. Some wheat and many varieties of fruit are grown here and command very good prices. Even this worthless district is gradually being taken up by the farmers, a sure sign that even the Cape Colony is getting crowded and that its agricultural capacities are perhaps being over-estimated.

I returned by another route to Burghersdam and continued my journey northward.

Little remains to be said of the country south of and about Rietfontein. One place only, "Abigwa's Puts," showed a large supply of water; beyond it we were put into the wrong road and experienced the unpleasant novelty of travelling for four days among the waterless downs.

At Rietfontein I gave the cattle another rest, and visited various places on horseback. "Mier" is the last inhabited place towards the east. Beyond it lies the Kalahari in all its terrific attractiveness. "Hogskin Vley" is a "pan" of large dimensions and probably the bottom of a former lake. Of these pans there are a great many in the country, and it is a very strange coincidence that always in their neighbourhood I observed sandspouts, some of which lasted many minutes and ascended to an immense height, carrying straws, or bits of paper, or other light objects up aloft with them. On most of the smaller pans a peculiar reflection of the sunlight in the hard-baked shining clay caused the apparition of open spaces of water. On the larger pans the reflection grew much more intense, and I never saw a finer mirage than when

a large herd of cattle and the herd-boy were distinctly reflected in what appeared a fine blue lake across which they seemed to wander.

Beyond Rietfontein, which is a very poor, unhealthy place, the country improves in many respects. The grass grows much closer together; often its place is taken up by a sort of bush resembling the Karoo bush, and last, not least, though as yet there is often no water to be met with for many days, it might be obtained at intervals of very few miles. The country beyond Rietfontein is a large plateau formed of limestone. Its surface is undulating and, in proportion to its extent, shows comparatively few channels to discharge the water which during the rainy season falls upon it. The country is covered with so-called "vleys," *i.e.*, depressions, in which water collects and remains for some time after the rainy season is passed. At this time of the year, after the rainy season, it is easy to travel through the country, as grass abounds and water is met with at short intervals. Gradually the hot atmosphere absorbs the water in the vleys, and the country relapsing into its arid state becomes very difficult to travel in.

By far the greater portion of the rain-water is absorbed by the porous limestone, in which it is partly kept suspended, partly percolates till it reaches a non-absorbing stratum, along the slope of which it passes on to the nearest outlet. As these outlets are few and far between, owing to the slight inclination of the strata, it is clear that percolation must be a very slow process, and the whole mass of limestone be filled with water like a vast sponge, which requires only very slight pressure to yield rich supplies of the precious fluid. Nature gives us a hint how to tap her rich stores. Many of the vleys mentioned above show a little water in their lowest part, and this the deepest of them retain even in very dry seasons. The natives have long noticed this, and their homes are invariably placed near one of these depressions, where they generally dig a hole which is soon filled with water. This serves for their cattle and themselves; for as a rule they are too lazy to mind that their own water-hole be not invaded by the thirsty beasts. It now seems quite clear that if the deepest of these depressions just reach the water-holding portions of the rock we need only dig a well in any part of the limestone district, and it will, if only about as deep as the vley or rather a little deeper, yield a supply so long as the level of the water kept in a state of suspension within the pores of the limestone does not sink below the depth of the well. Nature teaches us, however, more than this, it indicates to the observant eye the exact spot where the tap ought to be inserted.

The Dutch farmers, who have a marvellous gift of adapting themselves to the mode of life required by the country in which they live, have long found out that water flows more readily in some places than in others, and have tried to recognise by visible signs on the Earth's surface the treasure below it; they have perfectly succeeded in this,

and will show to the uninitiated certain indications which they call "aare" or veins. In some instances these are only disturbances of the strata, in others the healthier growth of vegetation shows the course of the subterraneous stream. In many instances the stranger cannot discover the signs, which the Boer (to whom they are plainly visible) tries his best to point out. There is rarely a mistake in these "aare." A Boer will discover one in a piece of land which is perfectly useless on account of its distance from the nearest spring; he will then hire or buy it from the bastard owner and at once dig a well in his "aar." A failure is the rare exception, and where formerly there was nothing but useless steppe, now numerous human beings find a comfortable existence and their herds of cattle excellent pasture.

On the whole the circumstances described above tend to show that we have before us a district chiefly suitable for the rearing of live stock, and hardly, if at all, fit for agriculture. This conclusion may be generally correct, yet there are exceptions. We do find spots which seem to invite tillage, and there is no doubt that in or near such places the future cities of the colony will rise. I remember one such place in particular, which my companions pronounced to be the finest farm they had ever seen in their lives. Water was plentiful and open, and the soil level, deep, rich, and moist. There are not, however, very many of these places.

The country as described above extends northward to about Rehoboth. It is chiefly covered with very rich greens or Karoo bush, but shows more thorn-trees and other shrubs the further we proceed north. The rivers we cross only in a very few instances show open water, but their beds are well defined and broad, and often water may be obtained in them by digging only a few feet. At Rehoboth there is a hot spring besides several cold ones; they have not been used for irrigation, or rather the attempt has been made and given up again, as it was not attended by very great success. Beyond Rehoboth we reach a mountainous district; hills rise abruptly from the plain, and offer very picturesque views. Water grows more plentiful; forest, or (as it is more aptly termed here) "bush," increases, but shows little useful wood beyond the unavoidable mimosa.

Soon we reach the foot of the so-called Awas Mountain, where water again seems more plentiful and several spots to be fit for cultivation. The mountains rise to a very considerable height, though the pass is only about 6000 feet above the level of the sea. The country now is no longer so uniform as hitherto. We find grassy plains and districts where the mimosa forms a rather dense and disagreeable cover. The latter places apparently possess mostly open water, and would often be fit for agriculture on a very small scale if a market for the produce could be created. In Windhoek, the former stronghold of Jan Jonker Africander, there are a great number of hot springs which, as there is

no arable land which might be irrigated by their means, have very cleverly been turned to account by being led into the various pretty houses, each of which has a bath-room with a running stream of hot water in it. A few people have made the attempt to plough land and cultivate it without irrigation and with only the habitual rainfall to depend on for moisture. It remains to be seen how far they are going to be successful.

Proceeding in a westerly direction from Windhoek, we cross a valley and soon again ascend the very steep side of the Komaab Plateau, the highest portion of which attains an altitude considerably above that of the pass across the Awas Mountain. In winter, snow has been seen here, and even in summer the nights are very chilly. There is little doubt that water will be found in a great many places yet, when this part of the country will be better known, and all farmers who have ever paid a visit to this out-of-the-way region, pronounce it to be first-class pasturage for cattle and sheep.

This plateau slopes in a westerly direction. The highest parts are grassland, only at a lower altitude we find bush again. At a place called Heusis, a few sheep are being kept, and would thrive well if they were properly attended to.

As we proceed westward the aspect of the country grows more uninviting, vegetation decreases, water grows scarce. At a place called Abokheibis, it may be said that we have reached the limits of that part of the country which can be developed by the ordinary means at the command of the simple settlers. The question remains how must they set about it. The history of South Africa answers the question. We notice that civilisation did not settle at various places on the coast and then gradually spread inland. On the contrary, only at one place, the Cape of Good Hope, civilisation landed and proceeded a very considerable distance to the northward. In the course of time it assumed a shape perhaps crude, but at all events perfectly adapted to the peculiarities of the country, and thence spread about till it emerged at the coast where, rather puzzled, it met with its older and more refined European sister, just in the act of very daintily putting her foot on the shore and very perceptibly turning up her nose at the healthy, but rustic and not very well-favoured relative. Yet the transmarine sister brought with her little but second-hand fine airs, the brown country maid supplied the wherewithal to make the sister's stay possible. Had it not been for the wool, the hides, ivory, feathers, etc., which the inhabitants of European origin brought from their homes in the interior to the harbours, these would in all probability even to this day have remained in a comparatively unadvanced state. It was the fact that trade could at once be established in these places which caused Europeans to settle there, and only when trade had sprung up to a considerable extent European enterprise could turn the land round the trade centres to account.

Those cognisant of South African history will recognise the truth of the above assertions which, had we set ourselves the task of writing an historical treatise, might be proved by many facts. The mode of procedure as described above is not the result of accident but of the physical condition of South Africa, and will, if analogies hold good, take place in South Western Africa even more distinctly than in its eastern parts. If here we have coast-lands particularly fit for tropical or sub-tropical products, which require time and capital to develop, we have on the western coast an arid barrier which hardly ever can be turned to account, and we have in both cases to rely on the productiveness of the interior for finding an outlet of its wealth towards the coast. Hence it may be expected that bold pioneers will travel northward from the Cape, settle on the wide, fertile plains and breezy hills of Western Africa, and living for years in a very primitive manner, will produce stock to such an extent, that at last their wealth, useless so long as it cannot be turned over and assume various shapes, will attract the trader and speculator. Then trade will bridge over the arid belt along the coast and regular communication between the interior and the desert coast will ensue.

The resulting trade will be considerable. The stock-growers will increase in number, and for years they will have to limit their wants to those productions which their flocks yield. When the increase of the latter will have given them wealth many long-suppressed wants will crave to be satisfied. Agriculture will always be very limited; groceries will therefore form a staple article of trade, and experience tells us that cotton goods are always in great request in wool-growing countries.

I do not speak of mineral wealth. It is only in countries the geology of which is thoroughly well-known, that the presence of any valuable mineral can with any degree of certainty be surmised. In wild countries the discovery of minerals is always a matter of chance, and should not be introduced into speculations about the probable development of a country. The prospect of an increased trade with the natives in the country under discussion seems to be rather limited. The Namas have few abilities, and their laziness and love of drink will ever be a barrier to a rise of their moral or improvement of their social condition. The fate of the real Nama leaves little doubt; they will, like the American Indian, recede before European culture, which would either force them into competition or subjection. For the former they lack the intellectual, for the latter the physical stamina. They will lead a precarious existence as herd-boys and thieves, till they have become civilised into the Kalahari or out of existence altogether. A better fate seems to be reserved for the so-called Bastards, whose good qualities may be brought out in the contact with Europeans, and it is very likely that from among their younger individuals we shall, in a not very distant future, recruit our upper or confidential servants, while the older men, being farmers and owners of large tracts of country and numerous

herds, will become the consumers of a part of the imported products of our home industries. With the Bantu inhabitants of the country the case is different; but as they belong to the districts further north they can have no place in the present discussion.

Very little remains to be said about the arid country west of Abokheibis. The want of water is severely felt, still more so the want of rain. Sometimes vegetation seems to make a sudden start, and then people like sending their cattle into this district, because it is free from diseases; and while the cattle feed here the grass on the farms (which is often grazed down to the ground) gets time to grow again. Cows in these parts, when milked, grow very thin. Neither can oxen live here and be worked; they do not find sustenance enough to keep in condition. Only young cattle—of whom no work of any kind is required, find enough food to present a sleek appearance.

One exception to this rule is the bed of the Swakob River. Though it is perfectly dry, it yet holds enough moisture to allow not alone a rich vegetation, but, in some parts, even a little agriculture. This river-bed may be considered the high road into the country, and there is no doubt that along it a few more settlements might be created. Of a continuance of this moisture in its bed there is no failure to be expected. It is yearly supplied by the rains which fall in the higher parts of the country, and which cause even the dry Swakob sometimes to carry seaward water which the soil found no time to absorb. Very few instances have, however, been known in which these floods reached the ocean. As a rule they are swallowed up by the ever-thirsty sand in the river-bed, so that even if at Otyimbingwe the river happens to be a roaring torrent, at Cannicontis it will be almost dry, only water will ooze into a hole of very slight depth instead of having to be dug for several feet. Thus we have good vegetation along the river-bed all the year round.

The country I have travelled over may be divided into four parts, by a line going about parallel with the coast from the Swakob River to the Orange, and through the place called Abokheibis, and by the degree of latitude of Rietfontein. None of the four parts is particularly fit for agriculture. The two southern ones offer good pasture-lands, but suffer from want of water, which does not seem to be procurable everywhere. The left half of the northern part is an absolutely worthless desert, and the right half contains some of the finest pasture lands I have seen in any part of the world; they offer the further advantage that with little trouble water might be procured almost anywhere. One thing all these parts have, however, in common, and that is, a bracing, salubrious, and lovely climate.

HISTORICAL EVIDENCE AS TO THE ZIMBABWE RUINS.

By Dr. H. SCHLICHTER.

Mr. Bent, speaking some few months ago before the Royal Geographical Society about the Ruins of Mashonaland, came to the conclusion that he could throw back these strange buildings to a pre-Mohammedan period, but that then came the difficulty.

The thought has since occurred to me that it would be interesting to investigate how far the various geographical reports which have come down to us from antiquity would contribute to the solution of the highly important question, namely, at what period these buildings were erected, inhabited, and finally deserted by a race which was foreign to Africa, and had reached these countries—far to the south of the Equator—at a time when no other communication whatever existed with the entirely unknown coasts of South Africa.

Mr. Bent expressed his opinion that these buildings are of Arabian origin, a view which my investigations fully confirm. In the first place we have to consider what connections existed in antiquity between Arabia and the East Coast of Africa.

What the Phœnicians were on the Mediterranean and the eastern shores of the Atlantic, the ancient Arabians were on many parts of the Indian Ocean. But the extent of their trade and the geographical explorations connected therewith, although of the utmost importance, are but incompletely known even up to the present day. Fortunately, however, the most reliable of the still extant writings of antiquity contain valuable information concerning the early enterprises of the Arabs. They show that the inhabitants of the south-western parts of the Arabian peninsula were the first to open up the southern hemisphere of our globe, penetrating, as they did, into the entirely unknown southern parts of the Indian Ocean.

South-Western Arabia was the centre of the maritime commerce carried on with the countries adjoining the shores of the Indian Ocean and Muza; Athana, Cane, and other coast places were the principal emporia for this trade. The 'Periplus of the Erythræan Sea,' well known as one of the most reliable books upon the commerce and navigation of the ancients in the Indian Ocean, testifies to the great importance of this commerce in the *early* times of antiquity, by stating * that in by-gone days when the merchants from India did not proceed to Egypt, and those from Egypt did not venture to the remote regions beyond Arabia, Arabia Felix, and especially the emporium situated on the site of the present town of Aden, was the centre of the whole

* 'Periplus,' Chapter 26; compare also Duncker, 'History of Antiquity,' vol. i., 1877, p. 322.

commerce in the same way as Alexandria was the commercial centre of Europe and Asia at the time when the 'Periplus' was written, namely, in the first century of the Christian era.

Moreover we learn from the 'Periplus' * that the coast of Eastern Equatorial Africa, corresponding to the Zanzibar coast of to-day, was a dependency of South-Western Arabia.

The author of the 'Periplus' says: "The whole territory of Azania and Rhapta is governed by the despot of Mopharitis, because the sovereignty over it, by some right of old standing, is vested in the kingdom of what is called Arabia Prima. The merchants of Muza farm its revenues from the king, and employ in trading with it a great many ships of heavy burden, on board of which they have Arabian commanders and factors who are intimately acquainted with the natives, and have contracted marriage with them, and know their language and the navigation of the coast."

We know that the region of Mopharitis or Mapharitis (the modern Ma' afir) is a district between Aden and the Straits, and Schwanbeck,† Kremer and Fabricius ‡ have shown that by the "tyrant of Mopharitis," mentioned in this passage of the 'Periplus,' we have to understand a vassal chief, or sheik, who was himself a dependent of the reigning Tobba of the Himyaritic family which reigned in south-western Arabia. The whole of the coast of Eastern Equatorial Africa was, therefore, under Arabian rule at the time when the 'Periplus' was written, namely, in the second half of the first century of our era.

The chief commercial centre for the intercourse with East Africa was, as the passage quoted states, Muza, the great emporium within the Straits of Bab-el-Mandeb, and this as well as the other descriptions of the 'Periplus' show that the trade with Africa was of the highest importance for the inhabitants of south-western Arabia.

But Arabian influence in East Africa was not merely of a temporary nature, but an old and permanent institution, as is plainly stated in the above cited passage, from which we learn that the sovereignty over Eastern Equatorial Africa was, by some right of old standing, vested in the kingdom of Arabia Prima. Sprenger § and Fabricius ‖ correctly remark that this can only refer to the old Sabæan-Gebanitic period, as the more recent Himyaritic dynasty was much too short a time in power to admit of its being referred to in this way.¶ Dillmann ** has proved that the

* Chapter 16.

† 'Rhein. Museum für Philologie,' Jahrgang 7, p. 335.

‡ 'Der Periplus des erythräischen Meeres, mit kritischen und erklärenden Anmerkungen,' 1883, pp. 135 *sqq.*

§ 'Das alte Arabien,' pp. 255 *sqq.*

‖ 'Periplus,' pp. 135–136.

¶ Compare also Caussin de Perceval, 'Essai sur l'histoire des Arabes,' tome i., 1847, pp. 47–61, 62 *sqq.*

** 'Monatsberichte der Berliner Akademie der Wiss.,' 1879, p. 425.

somewhat peculiar expression of Arabia Prima is perfectly correct, and that it refers to Muza as distinguished from Aden, which was in earlier times the exclusive emporium for ships coming from and going to East Africa and India, and was for this reason, down to Ptolemy's time, simply called *Arabia emporium*.

All other ancient geographers, who had some detailed knowledge of South Arabia and the regions beyond, fully confirm these statements of the 'Periplus.'

Agatharchides,* Strabo,† and Ptolemy‡ testify to the maritime commerce of the inhabitants of Southern Arabia.

Eratosthenes,§ the greatest geographer in the earlier days of Alexandria, speaking about the navigation on the coasts of Arabia and East Africa beyond the Straits of Bab-el-Mandeb, states that the navigation extends along the myrrh country, in the direction of south and east, as far as the cinnamon country, a distance of about 5000 stadia.

Artemidorus‖ says the Sabæans either cultivate the ground or follow the trade of dealing in aromatics, both the indigenous sorts and those brought from *Ethiopia*. He further remarks about them that they have become very rich by their commercial enterprises, and possess great quantities of gold and silver, so that even the doors, walls, and roofs of their houses are variegated with inlaid ivory, gold, silver, and precious stones.¶ I have shown on a previous occasion** that Ptolemy has left us a very good description of the east coast of Africa as far south as Zanzibar and Ras Mamba Mku, and he himself states in the first book of his Geography that he obtained the most valuable part of this information from merchants coming from Arabia Felix. They gave him a most accurate description of the emporia, distances, and directions along this coast, on which they had numerous settlements and trading stations.

But not only was the coast in the hands of the Arabs, but we have good reason to believe that their trade connections and influence extended also over a considerable part of the interior of East Africa.

Thus we see that all the best authorities of antiquity agree that Eastern Equatorial Africa was under the influence of South-Western Arabia; that this influence was, in the first place, due to trade connections, but that according to our best and most reliable source of information, viz., the 'Periplus of the Erythræan Sea,' Eastern Equatorial Africa was for a long time politically dependent on Mopharitis and Yemen.

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* 'De Mari Erythræo'; C. Müller's edition, 'Geographi Græci Minores,' vol. i., 1855; compare also Bunbury, 'History of Ancient Geography,' 1879, vol. ii., p. 59; and Glaser, 'Geschichte und Geographie Arabiens,' pp. 10–11.

† Book XVI., Chapter 4, § 23.

‡ Book I., Chapter 17.

§ Strabo, XVI., Chapter 4, § 4.

‖ Strabo, XVI., Chapter 4, § 19.

¶ Compare also Agatharchides, *loco citato*.

** *Proceedings*, R.G.S., September, 1891.

No other nation or country is mentioned in the classical writings of antiquity that had permanent political or commercial connections with the east coast of Africa. Many Greek merchants, it is true, in the later times of the Ptolemæan dynasty, and under the Roman empire, visited India and East Africa; but we learn from Ptolemy's Geography, as well as from the 'Periplus,' that such journeys were only commercial enterprises of a purely private character, without any ethnographical or political importance whatever. Eastern Equatorial Africa was, during the Greek and Roman periods of antiquity, under the sovereignty of South-Western Arabia.

Reverting to the ancient buildings of Mashonaland, we are compelled to come to the conclusion that the only nation which might come into consideration during the Greek and Roman times of antiquity, is that which held exclusively the trade with Eastern Equatorial Africa—viz., those Arabians who inhabited the South-western parts of the Peninsula. But nowhere can we discover the slightest trace or hint referring to any colony or emporium to the south of the Zanzibar coast. Ptolemy's furthest point to the south is Cape Prasum, the position of which is doubtful, and we know that he erroneously believed that from this point the coast of Africa turned to the east, and that a hypothetical continent connected Africa with the country of Cattigara, in Eastern Asia, thus regarding the Indian Ocean as an inland sea, analogous to the Mediterranean, but of much larger extent.

The author of the 'Periplus' is more correct in this respect in saying that the emporia of the Rhapta territory are the last on this coast, and that beyond these parts an ocean hitherto unexplored curves towards sunset, and, stretching along the southern extremities of Ethiopia, Libya, and Africa, meets the western sea.*

I have, in a previous publication, pointed out the high importance of this passage as compared with the statements by Ptolemy and other ancient writers. But Glaser,† the well-known Arabian traveller, goes too far in regarding this passage, in his recently published work, as a direct reference to the districts near the Cape. On the contrary, the statement that this southern ocean was regarded as entirely unexplored proves that no Arabian colonies existed to the south of Rhapta at the time when the 'Periplus' was written, because it is utterly impossible that at this age the Arabs could have kept their knowledge of these places secret from their numerous Greek friends and competitors.

The entire absence of any information referring thereto further proves that such extensive colonies as those of Mashonaland could not have been built or inhabited within a century from the time when the 'Periplus' was written; and we are, therefore, obliged to draw the

* 'Periplus,' § 18.

† 'Geschichte und Geographie Arabiens,' vol. ii., p. 206.

conclusion that no connection whatever *can* have existed between Arabia and South-eastern Africa during the period extending from the end of the first century before, to the middle of the second century after the commencement of our Christian era. Therefore it is absolutely impossible that the ruins of Mashonaland could have been built, inhabited and deserted within this period of time.

Ptolemy, the last of the ancient authorities quoted, wrote about the middle of the second century of our era. In the year 634 A.D. South-western Arabia was absorbed by the Mohammedan conquest, and we have, therefore, now to consider the possibility whether the ruins were erected during the time from 150 to 634 A.D. It is easy to show that this was not the case. According to Bent and Maund the ruins represent a great gold-producing centre, and there can be no doubt that the foreign invaders who erected and held them exported enormous quantities of the precious metal. Mr. Maund, who has studied the subject, says that it is astonishing to see the amount of work done by the ancients; millions of tons of soil must have been overturned, and thousands of slaves employed; for he is of opinion that it can have been nothing else than slave labour, as is evident from the crushing-stones.

But there is no indication whatever that any considerable amount of gold was imported into Southern Arabia during this time. On the contrary, the rapid decline of the Himyaritic kingdom soon after the second century of our era is well known.* A natural phenomenon, the destruction of the great dyke near the Sabæan capital of Mareb by mountain torrents,† caused great changes in the south-western part of the Arabian peninsula. It probably took place at the beginning of the third century; and this misfortune, which by Oriental writers is spoken of under the name of Seil-al-Arim, was of disastrous consequences for Yemen. The country round the capital, formerly fertile and prosperous, now fell rapidly into decay, many influential families left the country, and the power of the kings waned more and more. The Jews, who, after the destruction of Jerusalem, immigrated in great numbers, gained considerable power; and Dsu-Nowas, who became king towards the end of the fifth century, adopted their religion, and persecuted all those who professed another creed.

Aryanism had at an early date been introduced into Southern Arabia, and was accepted in many parts of the country, *e.g.*, by the tribes of the Himyar, Ghassan, Rebia, and the inhabitants of Nejran. The latter, especially, greatly suffered from the cruelty of Dsu Nowas, and it is well known that the persecution of the Christians was the reason for the great Abyssinian invasion of Yemen in the year 529, by which the Himyaritic kingdom was overthrown. Its re-establishment in the year

* Compare Glaser, *eodem loco*, vol. ii., pp. 240–241.

† 'Historia Jemanae,' edidit Johannsen, 1828, p. 283.

602, with the assistance of a Persian army under Wehraz, was only of very short duration, for in 634, according to Palgrave, South-western Arabia was finally conquered by the Mahometans.

It is evident that during this period of incessant internal feuds and religious quarrels no colonies like those to which the ruins of Mashonaland belonged could have been formed; and the introduction of Judaism and Christianity into Yemen at a very early date is strong proof that these ruins—which were unmistakably built by the Arabians when they were devoted to phallic worship—cannot possibly belong to this period of the history of Arabia.

I think I have herewith conclusively proved that the ruins in question neither belong to the time in which the Himyaritic dynasty flourished, viz. from the first century *before*, to the second *after* the beginning of our era, nor to the subsequent time in which the Himyaritic kingdom under the influence of Judaism, Christianity and Mohammedanism, declined and finally perished.

Mr. Bent threw these ruins back to a pre-Mohammedan period, but I think I have shown that we are fully justified in throwing them back to a much earlier date, viz. for more than 600 years, that is to say, to the time before the commencement of our Christian era. Therefore, these most important remnants of a bygone age—which Carl Ritter,* more than seventy years ago, regarded as most important for the comparison between the ancient and modern geography of Africa—point to a still earlier date, and must have been erected before our Christian era. Probably they belong to very much earlier times, but prior to Strabo's time classical information about Southern Arabia and Eastern Equatorial Africa is so fragmentary and unconnected, that accurate conclusions about the extent of Arabian influence in East Africa are impossible.

We must, therefore, rest satisfied for the present with having proved that these ruins, and the Arabian colonisation in South-East Africa connected therewith, are prior to the above stated period.

I should like, however, to mention a number of facts which may, in connection with future investigations, throw more light upon the origin of these buildings. Firstly, the large circular building of the Great Zimbabwe ruins, as described by Mr. Bent, is built of small blocks of granite broken with the hammer into a uniform size, but bearing no trace of chisel-marks, and no mortar had been used in the construction (*Proceedings*, R.G.S., 1892, p. 277).

The same kind of construction, viz. hewn stones neatly put together without mortar, was found by Halévy † in the ancient and great ruins of the city of Me'in in South Arabia, only that in this case the stones are larger. Halévy found the ruins of Me'in to be in all probability the

* 'Erdkunde,' Africa, 1822, p. 144.

† 'Journal Asiatique,' 6e série, t. 19, 1872, pp. 32, 75, 85, 508.

ancient capital of the Minaei, the "gens magna" of Arabia, a tribe about the position of which, in the modern map of Arabia, geographers for a long time greatly differed.

Not far from this place, at Berahhish, in the lower Jaouf district, he discovered the ruins of an ancient temple which, according to an inscription it bears, was dedicated to "Attar, and to the gods of Me'in and Ital, to all the gods of countries and nations, to all the gods of the sea and the land, and of the orient and occident, and to the kings of Me'in." This is an ancient ruin, and surely the people who dedicated a temple to all the gods of the sea and land, and to the gods of the different countries and nations, must have had some intercourse by sea and land with foreign countries. That not only the gods, but also the kings of the Minaei are mentioned, may perhaps be a clue that this tribe, well-known to the classical writers, was one which, at an early date of antiquity, had partly exchanged already the nomadic and agricultural pursuits of their kinsmen, for the more dangerous but profitable calling of the merchant and navigator.

The second point is, these ruins of Mashonaland were doubtless in connection with the gold production carried on in the surrounding country, and enormous quantities of gold must have been exported from South Eastern Africa to Arabia at the time when this gold production flourished. Now, I have carefully looked through the statements of the classical writers, but I am unable to discover that gold formed an important trade article of South Arabia during the classical period of antiquity. Of course, different authors mention that gold was found at various places of the Arabian peninsula; but this gold is of subordinate importance. Herodotus * states that the Arabians paid a tribute of 1000 talents of frankincense to Darius. Pliny † says that the Sabæans are very rich, because the Arabs always sell but never buy anything, and according to Strabo ‡ this was one of the principal reasons which influenced the avaricious Emperor Augustus to undertake the expedition of Aelius Gallus against the southern Arabs. But nowhere is the slightest hint to be found that gold was a trading article of the southern Arabs during the classical period. Quite different, however, are the much more ancient reports of Palestine and Egypt. Mr. Bent is correct in saying that the Bible is full of allusions to this fact. Sabæan gold is mentioned, *e.g.*, by Ezekiel as one of the chief articles of trade between South Arabia and the Phœnicians. Moreover, the Arabians paid tribute in golden ingots and rings to the Kings of Assyria and Egypt. The celebrated inscriptions on the temple of Deir-el-Bahari § clearly point

* Book III., Chapter 97.

† 'Hist. Nat.,' Book VI., Chapter 32.

‡ Book XVI, Chapter 4, § 22.

§ See Mariette, 'Deir-el-Bahari, Documents topographiques, historiques et ethnographiques,' 1877; and Dümichen, 'Die Flotte einer ägyptischen Königin,' 1868.

to East and South Africa, as many of the animals depicted, *e.g.*, giraffes, leopards, baboons, and also some of the natives are clearly of African origin, and one of the chief articles which the Egyptian ships brought from the country of Punt was a great quantity of fresh gold from the country of the Amu.

It is a remarkable fact that even as late as at the time of Herodotus East Africa was known as a gold-producing country. The father of history states * that at the furthest limits of Africa there is a country where gold is obtained in great plenty, huge elephants abound, and there are wild trees of all sorts, including ebony.

Later on, at the time of the 'Periplus,' gold was entirely unknown as a product of East Africa.

Thirdly, it is evident that some of the Mashonaland ruins were used for religious purposes. Now, we know from the very careful investigations of Lenormant † and others, that solar and astral worship was the foundation of the old religion of the inhabitants of Yemen, but that they also worshipped stones analogous to those which we find in the Phœnician temples of Tyre, Byblos, Paphos, Malta, Gozo,‡ and many other places, and which represented *Baal* and *Ashera*.

And this is exactly what we find at Zimbabwe. That the sun formed the principal part of the worship of the old colonists is proved by Bent's discoveries, and the stone similar to the Phœnician cone is the now celebrated conical tower of Zimbabwe, which is not less than 32 feet high. Lenormant adds that each place of worship was dedicated to a particular god, but other gods were likewise worshipped at the same place. Within the sacred precincts, oxen, sheep, or camels were slaughtered, often in great numbers. Besides, land, cattle and slaves belonged to these places of worship, which were donations from rich and devout people.

We know that at Zimbabwe various other buildings were within the precincts of the temple, which were probably occupied by the officials, the slaves, and the cattle. This fact reminded me of a report of Herodotus,§ of which, as far as I know, no satisfactory explanation has yet been given, viz., the so-called table of the sun. This is described as a meadow within the skirts of a city in Ethiopia where *boiled* flesh was provided by the magistrates of the place, and everybody could eat as much as he liked during daytime.‖

Wilkinson ¶ remarks that the custom of boiling flesh seems to have

* Book III., Chapter 114; compare also Rawlinson's edition of 'Herodotus,' vol. ii., p. 417, note 5.

† 'Histoire ancienne de l'Orient,' 9e édit. vol. 6, 1888, pp. 392 *sqq.*

‡ Compare Perrot & Chipiez, 'History of Art in Phœnicia,' vol. i., 1885, pp. 61, 275, 276, 281, 311, 312.

§ Book III., Chapters 17 and 18.

‖ Compare also Pomponius Mela, 'De chorographiâ libri tres,' Book III., Chapter 9.

¶ Rawlinson's edition of 'Herodotus,' vol. ii., pp. 417–418, note 6.

been very ancient with the Arabs, whilst the Egyptians more frequently roasted it, and boiled their fish. The whole report, compared with the above described religious customs of the Arabs, seems to point in the direction of the ancient Arabian sun-worship, which was doubtless practised at Zimbabwe and the other Arabian colonies of Mashonaland. This is, of course, merely a suggestion to which I attach no importance; but I thought it would not be out of place to mention it in connection with the above stated facts referring to the ancient Arabian solar worship.

All that I wanted to show respecting these ruins is the fact which I consider conclusively proved, that they are not only of pre-Mohammedan origin, but that they could not possibly have been erected during the six hundred years preceding the Mohammedan era. Furthermore, all that I have ascertained confirms Mr. Bent's statement that they are of Arabian origin. I have pointed out in the course of this paper that Eastern Equatorial Africa was, during the classical period of antiquity, a dependency of South-Western Arabia. For a very long time it was almost entirely unknown to Greek and Roman geographers. Even Strabo's information was very limited, and did not extend further than the regions near Cape Guardafui. The reason was that the Arabs had monopolised the maritime trade with the countries beyond the Straits of Bab-el-Mandeb. But suddenly a change took place. Was it the growing commercial importance of Alexandria, which would no longer allow Greek and Roman merchants to be excluded from the Indian Ocean? Was it the decline of the ancient kingdom of South-Western Arabia which was unable to protect the monopoly of olden times? We are unable to answer these questions at the present time.

But I have shown that we know for certain that in the first and second centuries of our era the Arabs willingly communicated to the Greek merchants and to the scientists of Alexandria their extensive knowledge of the unknown countries to the south, and that, therefore, the ancient African discoveries of the Arabs were not entirely lost to science, but form one of the most interesting and important parts of the historical geography of Africa.

In conclusion I may be permitted to add that some further mathematical and historical evidence about the ruins of Zimbabwe has been published by me in *Petermann's Geographische Mitteilungen*, 1892, Heft. 12.

THE PLATEAU OF LORRAINE.*

The true scope and aims of geography as a science are still so far from generally understood, in this country at least, that the little work which

* 'Le Plateau Lorrain. Essai de Géographie régionale.' By B. Auerbach, Professor of Geography at Nancy. Berger-Levrault & Co.: Paris and Nancy, 1893.

has lately appeared under the above title deserves special notice, as one in which a consistent attempt has been made to bring to bear on a limited area such a method of investigation as shall throw light on the harmonious interaction of the causes to which the varying relations between man and nature are due. In his preface the author shows for what reasons so much of existing regional geography falls short of this object. *Artificial* (*e.g.* administrative) divisions of a country have been made the basis of the various treatises, whereby the harmony which reigns in districts which possess a *natural* unity has been lost sight of. A definition of such natural regions is thus necessary at the outset. M. Auerbach points out that the term *pays* has already acquired a technical signification among geologists, as applied to such sections of a geological formation, as by their particular characteristics possess an individuality of their own; and the immense influence exercised on human life by such peculiarities of soil and structure makes the essential element the same for the geographical unit also. Here, however, other considerations arising from climate, and to some extent from political or historical factors, have to be taken into account in addition.

The Plateau of Lorraine lends itself particularly well to a division into such natural regions, which agree well on the whole with long recognised districts (Le Barrois, La Woëvre, etc.), the names of which are thus applicable. The country forms the eastern edge of the "Paris basin," and the various beds of the Jurassic and Trias formations succeed one another with remarkable regularity, sloping gradually upwards from the west, but falling to the east in steep escarpments. The alternations of limestones, forming elevated bands, with clays and marls, which appear rather as gently sloping plains, results in a succession from west to east of natural regions corresponding with the various formations, while minor variations in the same zone, caused by faulting, etc., enable us to trace distinctions as we proceed from north to south. There can be no doubt that these regions, laid down by the author, do possess a distinct individuality, and although similar conditions tend to some extent to be repeated (*e.g.* the limestone plateaux have naturally a certain family resemblance), yet local causes have special effects on the life of the inhabitants, and the laws which govern this may be best elucidated by studying each region in turn in its entirety. Among the points to which special attention is directed we may mention the grouping of the inhabitants according to the presence of water, and the agricultural or other capabilities of the soil; the effects of geological structure on the courses of the rivers, and the resulting facilities for communication; the effects of the situation of the province in the debatable ground between France and the Empire; and lastly the movement of population and its causes.

A few of the most striking features of the various districts may be given by way of example. The *Barrois* is a plateau of Portlandian

limestone, forming the western frontier of Lorraine. The aridity of the upper regions, caused by the porous nature of the soil, makes the population tend to congregate in the river valleys, which are also highways of communication between the Seine and Meuse. The liability to invasion, either from east or west, led some however to retreat to the plateaux, where also the quarries, the deposits of iron, and the forests, led to the formation of villages. The valley of the Meuse, which is shut in in part by cliffs of Corallian limestone is especially liable to floods. The deposits left by these fertilise the meadowlands, and much fodder is grown and exported; the crops, however, often suffer immense damage. The valley has become an important line of communication between the coal-fields of Belgium and the iron-works of the Moselle, by which local industries too have been stimulated. The forests of the Cotês de Meuse (Corallian), bordering that river on the west, have given considerable employment in wood-work; population, however, is attracted more to the plain of La Woëvre to the east (Oxfordian), whose clayey soil is devoted to the cultivation of cereals. On the plateau of Briey (Bathonian) the presence of iron ore brought early prosperity to the district, the abundance of wood favouring the rise of smelting furnaces. The zone of the lias, with its fertile and easily worked soil, may be called the granary of the province, of which it is also the centre. Population was early attracted, and here in time was formed the nucleus of the Lorraine dominion. The Moselle has exercised an important influence on the prosperity of this zone. Its old connection with the Meuse by the strait west of Toul, and the slight barrier between its basin and that of the Saône, have rendered possible a system of communication by canals, connecting the North Sea with the Mediterranean, and the Atlantic with the Rhine and Danube. Near the crossing of the two main lines is situated Nancy, in the centre of an important iron district, which supplies much of the traffic. In the zone of the Trias, further east, important deposits of salt and gypsum gave rise to an industry at a very early date.

Through all these various regions, one fact is uniformly observed, viz., the steady decline of population, even in the most favoured parts. The industrial centres, it is true, gain at the expense of the rural districts, but even this gain is not always maintained. Statistics show generally an excess of deaths over births. M. Auerbach gives much attention to a search for the causes. Affluence as well as want, he says, seems to contribute to the result, there being often among the well-to-do a disinclination to increase the number of those among whom the land is to be sub-divided, and celibacy is much in favour. The race, however, is uniformly described as robust, though some industries are harmful, and in parts give rise, it seems, to drunkenness. Yet statistics show that in some agricultural parts infirmities are more prevalent than in neighbouring industrial districts, from which the conclusion

is drawn that heredity exercises a more important influence than environment.

The question of the individuality of Lorraine as a whole is not entered into very fully by the author, who sums up very briefly the results of his investigations as affecting the province generally. He holds that it does certainly form a distinct geographical entity, but except the regularity of its structure and the even level maintained by the crests of the ridges, he does not show what broad characteristics distinguish it from other parts of the Paris basin. The Jurassic beds all pass out of the limits of the province, and the natural boundaries suggested are not very decided in parts. Towards Germany, the Vosges, the Permian and carboniferous *massifs* of the Saar, and the Ardennes, are held to be unmistakable natural limits, while on the side of France the transition is said to be imperceptible. Yet elsewhere the importance of the Moselle in forming a tie with the regions to the north-east is pointed out, and the long hostility of Lorraine to France is ascribed to geographical causes. The small influence of the German race on its inhabitants is, however, pointed out in several places.

There is, perhaps, some risk in this method of inquiry, lest the mutual relations of the various units of which a country is composed should be lost sight of. The work, however, only professes to be a chapter in general geography. The author has brought to his researches that philosophic spirit which can alone lead to a profitable result, and a large measure of success has been attained in the attempt to explain the phenomena observed. He has had recourse to the most complete sources of information on the various subjects dealt with, and copious references to authorities are added to the text. The book is well illustrated by reproductions of photographs and by numerous sketch-maps.

THE PEVTSOF EXPEDITION AND M. BOGDANOVITCH'S SURVEYS.*

By E. DELMAR MORGAN.

When the late General Prejevalsky died at Karakol, at the east end of Lake Issyk-Kul, as he was on the point of setting out on another expedition to explore Northern Tibet, the Russian War Minister and the Russian Geographical Society selected as his successor Colonel Pevtsof, an officer well known for his excellent geodetic surveys in Jungaria, Mongolia, and along the Chinese frontier, as well as for his treatise on a new method of finding the latitude by the corresponding altitudes of two stars, which he kindly explained to the writer at Omsk in 1880. The staff of his expedition was composed of the two officers, Captain Robarofsky and Lieutenant Kozlof, who had accompanied Prejevalsky's former expeditions, and of the mining engineer, K. I. Bogdanovitch, known for his geological investigations in Trans-Caspia and

* Map, p. 96.

North-Eastern Persia. Besides these officers, twelve Cossacks, an interpreter, an assistant for dressing skins of birds and animals, and native guides formed the *personnel* of the expedition.

To summarise as briefly as possible the results obtained by the expedition and its leader before noticing the special part taken in it by Bogdanovitch, I cannot do better than quote General Stebnitsky's report to the Russian Geographical Society.* He says: Thus for the first time an itinerary has been laid down and explored from the bisection of the caravan routes near Ush-Turfan in a south-easterly direction to the River Yarkand-daria; along this river for about 270 miles to the city of Yarkand; the position of this river and of objects along its banks having thus been for the first time ascertained by Pevtsof and his companions. From Yarkand the expedition joined the highroad leading past Khotan and Keria to Niya, surveyed by former explorers, and plotted on the map according to the observations of English travellers. From the oasis of Niya the travels and surveys of Pevtsof and his companions, to the north (as far as Mazar Jafar Sadyk), to the east and south, to the elevated plateau of Tibet, contribute many new geographical and cartographical data. To the south-east of Cherchen, the expedition went as far as Unfreezing Lake (Aiag-kum-kul), and thus linked its survey with that of the late General Prejevalsky. The most important geographical observations made in the course of the expedition were those undertaken in the great area containing Lakes Achik-kul and Aiag-kul, situated between the Kuen-Luen, the ranges of Astyn-tagh, Tokuz-dawan, and Akka-tagh. Quite a new light has been thrown on this borderland of Tibet by Pevtsof's surveys.

Farther north the route taken by the expedition along the Cherchen-daria, closing upon and bisecting the itineraries of Prejevalsky from Lob-nor, and along the Koncheh (or Kurla)-daria, goes as far as Kurla (Kuropatkin's farthest in 1876–7). Eastward of Kurla, Pevtsof's expedition carried their survey round the whole of Lake Baghrash-kul, the western end of this lake having been reached by A. Wilkins, Kuropatkin's companion, in 1877; he was, however, only able to establish the fact of the existence of such a lake; it has now been accurately surveyed for the first time. Furthermore, Pevtsof's survey from Manas to the Russian frontier supplies new facts for the cartography of the region traversed.

Combining all the geographical work done by the several members of the expedition, we obtain the following: A route survey, 6300 miles in length, 4000 of which were taken by Pevtsof's own hand with plane-table, on a scale of 5 versts to the inch, the heights of distant mountains having been measured. The latitude and longitude of 34 points have been determined astronomically, and of these 18 were fixed by Pevtsof himself, besides six longitudes by lunar occultations of stars. All Pevtsof's positions, being those of an experienced geodetist, have considerable weight as regards accuracy; thus the probable error in the determination of time by a pair of stars (at equal altitudes) is only $\pm$ 0·1″, and the probable error in latitude $\pm$ 0·7″. No less than three hundred and fifty heights were determined barometrically, and one hundred of these by Pevtsof himself with mercurial barometer.

Near Lake Dashi-kul, in order to ascertain by triangulation the height of Mount Ak-tagh (in the Kuen Luen), Pevtsof measured a base, 2 miles in length, from which he took angles to the summit of the mountain. By means of this base he made some interesting observations on the velocity with which sound travels in these regions at an elevation of 14,000 feet above the sea, the mean of twelve good observations resulting in a velocity of sound = 1068 feet per second, or 325·5

* Otchót (Report) for 1891.

mètres, and this, after applying corrections for temperature, gave a deduced velocity of 330·7 mètres per second.

The highest points reached by the expedition were 18,000 feet (Robarofsky) and 19,000 feet (Bogdanovitch), and near Toksun they discovered the hollow of Assa, 160 feet below sea-level, the same hollow having been observed at its eastern end by the Brothers Grum-Grijimailo.

Magnetic observations were carried out by Pevtsof at ten points, and at two of these all the co-ordinates—variation, dip, and magnetic intensity—were determined. Collections in zoology, entomology, and geology were made, and ethnographical particulars relating to the inhabitants of those regions, collected.

Thus far General Stebnitsky, we now proceed to the account given by Bogdanovitch* of his explorations. The geography of the regions he was about to visit had been outlined by former travellers. Following the chronological order, these were from the Indian side—Mir-Izzet-Ullah in 1812; Thompson in 1848; Hermann Schlagintweit in 1854–8; Pundit Muhammed Hamid in 1864; Johnson in 1865; Robert Shaw in 1868–9; Hayward in the same years; Henderson in 1870; Forsyth and the officers of his expedition in 1873; Pundit Nain Singh in 1865–6 and 1873–5; Carey and Dalgleish in 1885; Ney Elias in 1887; Younghusband and many others in 1887–90. From the Russian side—Trushnikof in 1713; Yefrémof in 1780; Valikhanof in 1858; Kaulbars in 1872; Kuropatkin in 1876; Prejevalsky in 1878 and 1885; Grum Grijimailo in 1886; Grombchefsky in 1885, 1887, and 1890.

While the general result of all their explorations was to acquaint us in broad outlines with some of the principal features of the physical geography, there yet remained much detail to fill in, and the state of our knowledge showed the want of systematic treatment.

There was, moreover, one great *desideratum* felt. Of all the above-mentioned travellers only three† were geologists, and not one of these returned to tell his tale. Adolph Schlagintweit was killed at Kashgar in 1857, and Stoliczka died on the Karakoram on his way back from Kashgar in 1874. To supply this want was, therefore, the aim and ambition of Bogdanovitch, whose earlier studies of the works of Humboldt and Von Richthofen and of his eminent countryman, Mushkétof, had roused in him an enthusiasm for the task, and a desire to continue investigations they had so successfully initiated.

If there were no more brilliant discoveries to make in descriptive geography, such as those associated with the names of the travellers and writers enumerated above, a closer study of the geology of the region on the spot might lead to generalisations and conclusions tending to the furtherance of knowledge. "The fertile syrts of the Tian Shan, the gigantic heights buttressing the Pamirs on the east, the stifling plains of Kashgaria and their oases, the sandy deserts with their buried cities, the wild and desolate mountain-chains of the Kuen Luen, and lastly the death-like solitudes of Northern Tibet," these, in the words of our author, were to be the scenes through which the expedition was to take its way.

M. Bogdanovitch, like many another traveller whose experience of mountaineering has been gained in the Alps of Europe, where fertile valleys and lowlands lend so pleasing a contrast to the background of rugged cliffs and snowy peaks, was much impressed with the grandeur of the scenery in Central Asia, where snowy chains

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* Trudii Tibetskoi expeditsii, part ii. St. Petersburg, 1892.

† M. Bogdanovitch speaks of *three*, but he includes Hayward who was not a geologist. Hayward's earlier training was that of a soldier, and he took up exploration from a general love for geographical science, not as a geologist.

extend in almost unbroken continuity for thousands of miles, where the uplands of Tibet and the plains of Kashgaria oppress the traveller from their very vastness.

Maps constructed after the most improved methods may give an idea of the leading physical features of the country, and enable one to take in at a glance immense tracts; but to realise the magnitude of Nature's work in Central Asia, to learn its aspect, it is necessary to visit and travel in these regions.

Leaving the Russian town of Prejevalsk on May 25th, 1889, M. Bogdanovitch, escorted by a Cossack interpreter, Shestakof, and two Kirghiz guides crossed the Tash-Rabat Pass (about 13,000 feet), and proceeded *viâ* Turugart to Kashgar. From this city he made an expedition to the Mustagh-ata* group with the object of studying its geology. To reach these mountains it was no longer possible at so advanced a season of the year to follow the valley of the Géz which traverses their whole width from west to east, and flows close under Mustagh-ata itself, for the rivers were already flooded with melted snow and ice. Neither was it possible to hire guides for the Kashgarian mountains. He therefore went first to Yanghi Hissar, and here with the obliging assistance of M. Petrofsky, the well-known Russian consul, succeeded in hiring men and pack animals for the transport of his supplies and forage, for at that season supplies were not procurable on the Pamirs. The little Karakul route by way of the Kara-tash Pass † was that chosen. Passing along the King-gol (Kinkol) and Ridjek streams he reached the foot of the Ridjek-dawan Pass (about 14,000 feet) on June 7th. Here he was delayed a day owing to the excessive steepness of the Pass. At length the baggage-horses were safely over, and the journey was continued with comparative ease for upwards of 20 miles, at first down the Chat-su, then up the Kara-tash-su to the Kara-tash Pass over the Mustagh-ata. The Kara-tash Pass (16,500 feet) under the best of circumstances is reputed to be the most difficult in the eastern border-land of the Pamirs. However, by hiring yaks of the Kirghiz, and favoured by splendid weather, the ascent was accomplished on June 9th without difficulty, after turning the gigantic moraine of a glacier, now hidden in the recesses of the defiles in the southern group of Mustagh-ata. Very little snow was left on the summit of the pass, but the descent towards Kara-kul was most difficult, the path for upwards of 13 miles clinging to the side of the mountain along huge slopes of detritus. Having skirted the south shore of little Kara-kul (about 12,500 feet) the party made their way round the western foot of the southern group of Mustagh-ata, separated from the northern peak by the gorge of the Iki-bel-su. The position of the little Kara-kul valley is compressed between the slopes of Mustagh-ata and the wall-like, granitic range of the Sari-kol mountains on the west. On the east, however, there is room enough for the Iki-bel-su to wind its course between the lake and the mountain much in the same way as the Chu approaches Issik-kul without mingling its waters with that lake. On the south and south-east of Kara-kul a gravelly, saline plain extends to some granitic heights connecting Mustagh-ata with the Sarikol range. These heights drain into the river-not by narrow water channels but by broad streams of a temporary nature descending the mountain sides. Having united at the foot of the mountains they flow in a wide, slightly inclined channel, at times over the perfectly level plain. The gravelly deposits formed by this system of drainage may be compared with those of Khorassan, the higher valleys of Tibet, and other valleys in the Pamir itself. Their irregular stratification may be attributed to the periodicity of the floods and varying volume of water discharged, though they might easily be mistaken for glacier-drift.

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* The Tagharma Peak of the maps.

† The route is mentioned by Trotter in the Report of the Mission to Yarkand, p. 265.

M. Bogdanovitch passed into the valley of the Tagharma by the Ulugh-Rabat Pass. Here he learned that there were no roads along the Yarkand-daria by which he might proceed to Yarkand, but only foot-paths, and that from the middle of June to the end of July, and even late into August, the rivers were unfordable. As the date for his rejoining the main expedition was fixed for June 22nd, he had to decide on the route *viâ* the Kok-moinak and Chichiklik Passes, and content himself with a survey of only the central portion of the Kashgarian Mountains.

The Kok-moinak Pass (about 15,000 feet) leads over the southern lower part of the Mustagh-ata group; the descent from this pass opens on a circular expansion of the Upper Dorshat-su Valley, separated by the low Chichiklik Ridge from the Tarbashi-su (tributaries of the Yarkand-daria). These valleys have all the characteristics of glacier-channels, with typical alluvial deposits in their lower parts very similar to those of the Kara-tash-su below the last Kirghiz camping-ground. Their higher valleys are specially selected by the Kirghiz for their summer pasturages, and it is only after the intense heats are over that these nomadising inhabitants descend below the great beds of detritus and the desolate transverse defiles to warmer quarters. Huge boulders of granite occur between the last camping-grounds and Pas-rabat. These and the rush of the torrents oblige the rider to dismount, and let his horse pick its way as best it can, while he wades in deep water, now climbing on to the blocks, now ascending the steep banks of the channel to escape being swept down by the stream. Here, in the very wildest part of the defile, M. Bogdanovitch came upon warm springs,* slightly ferruginous, with a temperature of 127° to 135° Fahr. They rise from thick masses of conglomerate rock overlying granite and crystalline schists.

From Pas-rabat our traveller rode *viâ* the Turut (Torut) Pass (about 13,000 feet †) to Chehil-gumbaz,‡ and descended the valleys of the Charling and Kaiz to Kuserab, a settlement on the Yarkand-daria, marked in his map as the site of a coal-mine.

In the valley of Tagharma there are several settlements of Tâjiks (*e.g.* Besh-kurgan and Chashman), known here as Sari-kolis. In winter they are concentrated near Tash-kurgan, and are also met with at Kuserab. They are distinguished from the inhabitants of the Kashgarian oases by their distinct Aryan type, and by their speaking Persian.

The Tagharma Valley is a wide pasture-land,§ visited in spring by thousands of Kirghiz from the neighbouring mountains; here and there are plots of arable land cultivated by Sarikolis, whose invariable corn-mills have given the country its name—Tagharma, *i.e.*, "corn-mill." Near Pas-robat, between Chehil-gumbaz and Kuserab, beyond the Kara dawan (11,000 feet) and Kizil dawan Passes, and in the valley of the Arpalik-su, wherever the valleys widen the Kirghiz pasture their flocks. Barley ‖ is the only corn which ripens.

On June 19th M. Bogdanovitch arrived at Yarkand with his tired-out horses, having accomplished 305 miles in fourteen days, over the worst of mountain paths. Here he rejoined the expedition under General Pevtsof, and

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* Warm springs were noticed by Colonel Gordon with a temperature of about 116°, *cf.* Report of a Mission to Yarkand, p. 223.

† Colonel Gordon gives the height at 13,400 feet, *cf. ib.* l.c. Trotter gives Torat (horse's sweat) as an alternative name for the Pas-robat Pass, *ib.* p. 266.

‡ Or "the forty domes," *cf*, Report of a Mission to Yarkand, p. 222.

§ About 12 miles long by seven broad, extending from the south-west to the north-east, according to Gordon. Report of a Mission to Yarkand, p. 224.

‖ A beardless kind, *ibid.*

accompanied it as far as Takhta-Khon in the mountains south-west of Kok-yar, whither they proceeded to recruit their tired camels. Leaving it once more at Takhta-khon he set off on another expedition to explore the mountains aligning the upper course of the Yarkand daria and advance as far southwards as circumstances might permit.

However few the itineraries of European travellers in the mountainous region bordering on Chinese Turkestan, the tract south-west of Yarkand has not been unexplored. The caravan route from Yarkand to Ladak, passing Kok-yar, Ak-Meshet and Akchi-Kabak, though easier than that *viâ* Sanju, has been abandoned, owing to the depredations of the Kanjutis. It was by this route that Forsyth's mission returned to Ladak in 1874, crossing by the Yanghi-dawan Pass, the easiest in this part of the Kuen Luen, into the Yarkand daria basin. Other passes are mentioned by Adolph Schlagintweit from hearsay information and by Grombchefsky, who approached the Yarkand daria (Raskem-daria) from the west in 1888. M. Bogdanovitch decided on exploring one of the passes between the Yanghi-dawan and Kurumat-dawan, hitherto entirely unknown.

On August 3rd, taking with him the same trusty Cossack, Shestakof, and two experienced natives he set out from Kok-yar, with a supply of bread and barley to last twelve days. Crossing the Tiznab at Mumuk he advanced along the valley of this river fording a number of its left affluents—the Gusás, the Usiás, the Chikhsho with its tributaries, the Yolun, Bolun, and the Pakhpu. The scenery here is very picturesque and the country comparatively fertile. Here, for the first time after leaving Russian territory, he saw fine forests of great extent and alpine meadows above the belts of forest land. The inhabitants of the Tiznab valleys are Yarkandi-Taghlyks (mountaineers) leading pastoral lives. In summer they usually drive their sheep and cattle to the alpine meadows near the sources of the streams, descending again in autumn and winter to the more central parts of the valleys where their permanent habitations, built of clay, are situated.

The Taghlyks of the Tiznab are emigrants from the west and are easily distinguishable from the aborigines, *e.g.*, the Taghlyks of Russian range (known to us by Prejevalsky's description as Machinians) by their pure Tâjik type.

At the tenth march from Kok-yar M. Bogdanovitch reached the source of the Pakhpu at Koi-yailak at the foot of the Takhta-korum Pass. Here he hired pack animals, and on August 25th began the ascent of this magnificent pass, leading across the principal chain of the Kuen-Luen. At 14,000 feet he found the soft loess replaced by rock detritus. Toward the summit mountains close in from every side to form a vast amphitheatre, entered by a giant staircase of natural steps of great width, slightly inclined and studded with blocks of fallen rock. The character of the scenery agrees well with the name—*Takhta-korum*, Persian for "rocky throne."

The ascent of the pass occupied eight hours of difficult climbing. Half way up their heads began to ache, giddiness was felt, and one of the guides expectorated blood. The hypsometer showed T = 182° Fahr., and *t* of the air = 39·2° Fahr. (about 17,000 feet). Masses of snow were only met with immediately below the summit where freshly-fallen snow was lying; in summer the pass is quite free from snow. The descent on the opposite side is very abrupt, lying over beds of detritus at an angle of 40°, into the deep valley of the Kulan-aghil (or Kulan-aryk), a right tributary of the Yarkand daria. Beyond the valley rises a snow-clad range with another terraciform ascent, though less remarkable than the Takhta-korum. M. Bogdanovitch crossed this range by the Kokelan Pass (about 17,000 feet—the snow line) and descended by the Malgum-bash gorge and the valley of the Bazar-dereh, a right affluent of the Yarkand daria. This is a raging torrent of dirty water, 30 to 40 yards wide, and

quite unfordable. It was hoped that by waiting till daybreak the waters might subside and become clearer so as to enable them to see the bottom; but this expectation proved vain, for when the morning dawned the torrent was, if anything, higher, and dashed its waves furiously against the schistose rocks. Yet to reach the sources of the Tiznab by the Yanghi-dawan and Chirak-saldi Passes it would have been necessary to cross the river five or six times. An attempt to circumvent the river by scaling the mountain side was unsuccessful and nearly terminated fatally, for M. Bogdanovitch slipped on the first detritus slope, and was only rescued from headlong descent to the precipice by the timely aid of his companion. This mishap decided him on tempting fortune no more, but to return the way he had come, *viâ* the Malgumbash and Takhta-korum Pass.

His second attempt to cross the Yarkand-daria was equally unsuccessful, and he then learned from the inhabitants that the only season of the year when this valley was accessible for horse and rider was the winter, and that in summer and autumn, not even at the villages of Pihl and Kuserab, could its stream be crossed. Above Pihl, visited by Grombchefsky in 1888, there are no settlements along the Yarkand-daria. Ruins of former villages may be seen occasionally, for instance at Ish-debeh on the Bazar-dereh above its confluence with the Yarkand-daria, a place where there had once been iron smelting works. M. Bogdanovitch did not discover the exact locality whence the iron ore, a brown ironstone, had been obtained, but the clay schists in the neighbourhood were found to be highly charged with ferruginous deposits. Many parts of the Yarkand-daria bear traces of smelting works like those at Ish-debeh, and the abundance of iron has, according to Grombchefsky, originated the names Raskem-daria, from *ras*-much and *Kau* mines. In this part of its course the river discloses to view metamorphic deposits of iron ore in very much disturbed schists of the Devonian series. The Arab geographers of the eighth to the eleventh centuries, and especially Edrisi, mention that Eastern Turkestan supplied the Western Mohammedan world with iron and iron-ware.* At the present day, however, only one of the mines of this brown ironstone, situated in the mountains south of Yanghi-Hissar, is worked.

These mountains aligning the Raskem-daria also abound in jade deposits. One of these, Shanut, on the northern slope of the Kuen Luen, was visited by Bogdanovitch. Copper is found at the confluence of the Yanghi-dawan-su and Tash-Kurgan-su (head waters of the Tiznab), and the metal obtained is minted. Our traveller had no opportunity of visiting this or the copper-mines of Kucha and Urumchi, known only by hearsay report. The copper-mines of the Tian-shan, between Aksu and Urumchi, were known in very early times, and were mentioned by Hwen Thsang, as well as lead, sulphur and alum. These mineral deposits are also spoken of in the history of the earlier Han dynasty in the first century, and Bogdanovitch considers the numerous traces of copper smelting observed by him refer back to the pre-historic age and possibly to the great migration of races from east to west.

The valley of the Yarkand-daria, near Ish-debeh, is comparatively narrow and diagonal or transverse with respect to the mountain chains as far as Pihl. Above the Yanghi-dawan road, however, it widens, and is evidently longitudinal. Though pasturage is abundant it is never visited by the inhabitants of the Tiznab Basin, who dread the Kanjutis. These marauders make their appearance in winter, descending from the Mustagh Range, where they leave their flocks and herds in some place of security while they themselves ascend by the Takhta-korum to the valleys of the Pakhpu and Chikhsho to collect tribute in the shape of cattle and money. Four years had elapsed since their last appearance. The inhabitants have come to regard

* Russ. ed. of Ritter's 'Asia.' E. Turkestan, ed. by Grigorief, ii. 225.

this tribute as obligatory, and collect it themselves in readiness for the Kanjutis, who are so much dreaded, that it was with great difficulty that Bogdanovitch could hire men at Pakhpu to go with him to the Malgum-bash.

The point where he struck the Yarkand-daria is some distance above Uprang, visited by Grombchefsky, and a long way from the sources of this river in the Mustagh Range, judging from the fact that the melted glacier water does not reach Ish-debeh before the morning. The sources of the Yarkand-daria have been described by the Brothers Schlagintweit; Grombchefsky crossed the Taghdumbash (Dangnin-bash) heights of the Mustagh, and Younghusband explored the now abandoned Mustagh Pass, so that very little remains unexplored of this range, except where the Yarkand-daria takes a sharp turn to the eastward. This particular locality is absolutely unknown.

The two head-streams of the Yarkand-daria, the Raskem-daria and the Taghdumbash-daria, unite below the village of Kuserab. On June 16th Bogdanovitch observed the second of these rivers to be smaller, narrower, and shallower at Kuserab than the Raskem-daria at Ish-debeh on August 27th. Unfortunately no contemporaneous observations were made, and therefore no positive conclusions could be formed. The Yarkand-daria is the chief river of Eastern Turkestan; its course is upwards of 1300 miles long, and the determination of its sources is an interesting geographical problem.

On August 30th, M. Bogdanovitch and his party reached Pakhpu, after three heavy days' marching on foot, extricating their worn-out horses with great difficulty from the rocky defile of Malgum-bash and the detritus-covered slopes of Takhta-korum. From Pakhpu two long marches over the Ishekat (about 14,000 feet, here they had to rope the horses) and Ak-korum Passes brought them to Expedition Camp. In nineteen days of itinerary they had gone 280 miles. They had examined the orography of the region visited, and had found that in this part of the Kuen-Luen the ranges change from a N.E.–S.W. direction to N.W.–S.E., forming an arc. The number of peaks and groups massed together to the east of Takhta-Korum and in other parts made it impossible to have a correct idea of the orography, the ramifications of separate chains, and their interlacement. This too explains the absence of any definite local nomenclature. The mountains are called after the rivers flowing below them (*e.g.* Pakhpu-tagh, Chikhsho-tagh, Gusas-tagh, &c.), or after the passes (Takhta-korum, Kulum-bagh, &c.), sometimes even after villages, and it not unfrequently happens that a mountain obtains different names from the inhabitants of separate valleys. Combined with this characteristic in the mountains is the complete absence of longitudinal valleys. Nearly all have either a diagonal or transverse direction with reference to the axis of the nearest chains, *e.g.*, all the left tributaries of the Tiznab. Pointed peaks, groups of jagged, snowy summits, now and again a well-defined snowy chain, the prevailing lines of the valleys with their much lower aligning hills, these are general features of the panorama. Towards the west, however, where the direction changes to N.W.–S.E., the scenery changes. The Chup and Kulan flow through distinct longitudinal valleys between the snowy ranges of Kulum-baghla, Takhta-korum, and Kokelan. The second of these forms the watershed between the basins of the Tiznab and the Yarkand-daria. South-east as far as Yanghi-dawan the mountains appear as a very lofty snowy mass, feeding the sources of the Tiznab (the Yanghi-su and Tash-kurgan) and the right tributaries of the Yarkand-daria (the Kulan-aghil and Bazar-dereh). The extension in an east-south-east direction of this main chain of the western Kuen-Luen is the lofty Arpa-vash-tagh, crossed by the high road to India at the Kilian Pass.

I have only mentioned in this short paper a few of the topographical results of

the Pevtsof Expedition. The observations made were of the most varied kind, and have thrown much light on the mineral and other resources of the regions visited. Among these, special attention is drawn to the part taken by the poplar forests in Eastern Turkestan in protecting the fertile tracts from the ravages of shifting sands, and to the system of irrigation adopted by the inhabitants, who allow their fields to remain coated with ice during winter, in order to ensure an early supply of moisture in spring for cultivation. The jade quarries and deposits, and the different kinds of this stone, precious to the Chinaman, are noticed at some length, and the information collected supplements the observations of the Brothers Schlagintweit and the late Dr. Stoliczka. A separate chapter treats of the gold placers and the manner of working these, celebrated since the time of Herodotus.

It is worth while remarking that, in M. Bogdanovitch's opinion, the only chance of penetrating into Tibet from the north-west is by travelling on foot, without any beasts of burden, the necessity for taking forage for these increasing their number without any advantage resulting from them. Donkeys, of course, would be the most serviceable, and he recommends making a start from Karasai, where animals, supplies, and men may be obtained. Water is always procurable under the surface in low spots between the ranges; and, if this should fail, snow-storms, of such frequent occurrence even in July, would supply all that was necessary. The best season for such an expedition, he says, is from July to September. But, on the whole, he would prefer Ladak as a base, an entrance being made into Western Tibet *viâ* Rudok or Tankse, *i.e.*, by the route recently followed by Captain Bower.

In conclusion let me say that the map to illustrate this paper has been most carefully compiled from every available source of information, and has been executed by Mr. Scharbau, the Society's draughtsman.

Note on the Map.—We may add that the map referred to above is part of the general map of Tibet, now in preparation for the Society. With this have been combined the surveys of Colonel Pevtsof and M. Bogdanovitch, as published by the Imperial Russian Geographical Society in the *Isvestija* and the 'Memoirs of the Tibetan Expedition,' Part II. The yellow portions on the maps indicate sand.

THE MONTHLY RECORD.

EUROPE.

New Geological Map of European Russia.—The Russian Geological Committee has just published a beautiful geological map of European Russia, in six sheets, on the scale of 60 versts (40 miles) to an inch. The last geological map of Russia was compiled by Helmersen in 1873, and is now old. Therefore the Committee, in commemoration of its ten years' existence, has prepared this map, which embodies all explorations up to date.

The Black Sea in Pliocene Times.—M. Andrussof gives a note on this subject in the *Bulletin de l'Acad. Imp. des Sciences de St. Petersburg* (1893, p. 437). While it is generally agreed that the basin of the Black Sea was separated from the Mediterranean in the Pliocene epoch (the Ægean being then dry land), its condition at that time is still a disputed question. From the presence of Sarmatic and Pontic deposits on its shores, M. Andrussof has long held that some part at least was then covered by water, while the nature of the fauna disclosed by certain deposits discovered by him in the Crimea leads him to conclude that the area was occupied by a large brackish lake, similar to those of the south of Russia. This view is supported by the dredgings carried out by the expedition of 1890, of which the writer was a member. The empty shells of brackish-water species, which alone were

brought up from deep water, differ from those of the present estuaries, but agree closely with those of the Caspian, to which the basin probably bore much resemblance. The question of the mode of formation of the Bosphorus and Dardanelles is difficult to decide; but M. Andrussof inclines to the opinion that they existed as river-channels as far back as early Pliocene times.

Cartography in Finland.—The Geographical Society of Finland has lately taken decisive steps for the construction of a reliable map of the country on a sufficiently large scale. A specially appointed Committee has drawn up an elaborate report which is now published in the Society's journal *Fennia* (1892, No. 6). The report gives first a review of the cartographic work hitherto done. The chief material for a map of the country is contained in the parish maps on the scale of 1 : 20,000, which were connected together and reduced into maps of the districts or *härads* (scale 1 : 100,000). These maps, prepared by the Economical Survey Administration, had, however, no satisfactory relation to astronomically or geometrically determined points, and the next task was to make such determinations. They were made at sixty-six different stations, and with the aid of the data so acquired an excellent general map was published in 1862–73, on the scale of 1 : 400,000, in thirty sheets. On the other side, the Russian General Staff has made for years past very accurate surveys and levellings in South Finland, various hydrographical maps have been prepared by the Administration of Ways and Communications, and various geodetical and astronomical works, precise levellings, and geological maps have also been completed. All the results so obtained are graphically represented on the maps which accompany the report. The report next discusses the degree of accuracy of these different works. In the general map there are errors of from 1′ to 4′, and occasionally as much as 8′ 20″ in longitude. The distances between separate stations are subject to errors of from 1 to 5·4 per cent. of the distance. The scheme elaborated by the Committee for further work includes, first of all, a good trigonometrical system in addition to the net of the meridian measurement and the one accomplished along the 60th parallel. Two lines of triangulation of first-class triangles crossing Finland from north to south and two lines running west and east are therefore proposed. They must be supported by a number of astronomical determinations, and precise levellings have to be made along all railways. These data will be used for the construction of a fundamental map on the scale of 1 : 20,000, as far at least as 63° N., while the northern parts of Finland may be mapped on a smaller scale. The polyhedric projection is advocated, each sheet of the map covering 6′ of latitude and 12′ of longitude. The appointment of a special Geodetical Committee is insisted upon, all cartographic work to be based in the future on the geodetical net work.

North-German Coniferous Forests.—In a recent issue of *Forschungen zur deutschen Landes-und Volkskunde*, Dr. F. Höek examines the general flora of the coniferous forests of North Germany, confining himself to this section for the present in order to limit the scope of his enquiry. Of the five species of conifers, which alone seem indigenous in the region, the yew occurs only in isolated localities, while the juniper hardly ever covers continuous areas as a tree. The limits of the extension of the three forest-forming species, run broadly from south-west to north-east, none being found wild in the extreme north-west. The pine has the widest extension, and in former times reached still further than at present. The Norway spruce and the silver-fir do not extend far over the plain, except in Silesia, belonging more properly to the mountainous parts. The author devotes most attention to the flora of the pine-woods, and gives a list of those which his researches prove most characteristic, proceeding next to investigate the limits of distribution of the

various species, as compared with that of the pine. The result is to show a remarkable agreement in the case of a large number, and Dr. Höck concludes that a real relation exists between the leading type and the associated species. In the case of many plants whose range in Germany is wider than that of the pine, the general distribution over Europe agrees more closely, and it seems likely that when (perhaps owing to a change of climate, caused by the irruption of the sea into the English Channel) the pine retreated from the north-west, other plants adapted themselves to the altered conditions, some now dispensing with the shade and forming heaths, while the true forest plants sought the shelter of deciduous trees. A map is added showing the distribution of the various species of conifers.

The Expansion of Vienna.—The late extension of the limits of Vienna, in December, 1890, gives occasion for a sketch by Professor Umlauft, in the *Deutsche Rundschau*, of the gradual expansion of the city from early times. The important part played by Vienna as an outpost against various invaders from the north and east makes its history of special interest. The seat of a Celtic settlement, when, in B.C. 15, the Romans extended their sway to the Danube, it became, under the name *Vindobona* (Celtic Findbonn), one of a series of forts placed as a check on the inroads of the barbarians to the north of that river. From the researches and excavations of Von Camesina, Von Hauslab, &c., it appears that, though enlarged under various emperors, it remained confined within very narrow limits during the Roman occupation, its importance centering in the modern "upper market" near the Danube canal. For some centuries after the Roman evacuation little definite is known. A Slav settlement seems to have been formed in the neighbourhood, as is indicated by the Slav name of Beč, still applied to the city by a section of that race. It again comes into prominence under the Franks, after the foundation of the "Eastern mark," as a barrier to the inroads of the Hungarians; and under the rulers of the House of Babenberg churches and monasteries began to spring up, the limits being gradually extended, until in 1282, when the sway of the House of Hapsburg began, it had almost reached the limits of the subsequent "Inner city." For some centuries later little growth is to be recorded; the city itself remained confined within its fortifications, though at some distance outside these important suburbs arose. These, however, all succumbed to the flames at the time of the second Turkish siege, in 1683, the then ruler causing them to be destroyed to prevent their affording shelter to the invaders. Having soon sprang up again and rapidly increased, after the departure of the Turks, they were enclosed within a new rampart at the instance of Prince Eugene, when (1704) the city was threatened by the French and Bavarians in the war of the Spanish Succession, the city thus attaining a far greater size than any previously. In 1858 Francis-Joseph I., by his order for the demolition of the walls of the "Inner city," removed what had been a great check to expansion. To the eight districts then formed, two more were annexed in 1861; while the latest extension in December, 1890, included an extent of suburbs larger than the whole previous area of the city, which hereby gained nine other districts, and attained to the second place among European capitals for extent of ground covered. The various stages are clearly shown on the map accompanying the note.

Frankfurt-on-Main.—The first part of a statistical description of Frankfurt-on-Main, illustrated by maps, and dealing chiefly with the growth and distribution of population and the occupations of the inhabitants, has lately been brought out under the auspices of the Statistical Office of that city. The population, which was only 41,458 in 1817, amounted in 1890 to 180,020, the increase having been especially rapid of late years, though not above the average for German towns,

except during the period 1875–80. The progress of house-building is clearly shown on the large general map (which also shows the 33 official divisions of the city), besides being illustrated by diagrams. Noteworthy points are the tendency to increase the number of storeys in the houses, and the number of separate dwellings in a building. A comparison of the number of houses in different quarters of the city in 1890 with that in 1761 shows that in the *Altstadt* (the most central portion) it has slightly diminished, while in the *Neustadt* (the zone immediately surrounding the former) the increase has been great. The speedy diminution in density of population in successive zones, compared with that in other large towns, is remarkable, that of the centre being unusually high. Counting only the area actually occupied by houses, one of the outer divisions (towards the suburb of Bornheim) stands first, the reason being the number of many-storeyed lodging-houses and the few business premises.

AFRICA.

Sir Gilbert Carter's Mission into the Lagos Interior.—The route followed by Governor Carter's party into the interior was by way of Abeokuta, Iseyin, Oyo, Ilorin, and from thence to the Niger. The return was over the same ground as far as Ilorin, from which place the party turned to the south-east, and passed through Ikirun, Osogbo, Ede, and Ibadan to Lagos. During the whole of the time, from Jan. 2nd to April 4th, the weather was favourable, and though small-pox was rife in some districts, neither of the five white men were ill. Mr. Fowler, the surveyor, who accompanied the mission, carried four watches with him, and during the whole of the journey the greatest discrepancy between them was ten seconds. The positions of fifty-seven places were fixed, and the survey agreed at the Niger with the Admiralty chart. The latitude and longitude of many places, as laid down on previous maps, are considerably in error, which necessitates some important changes in the map now in course of construction by Mr. Fowler. The natives were, on the whole, very friendly, and all the country up to the Niger was found to be thickly populated, though numerous ruins of deserted towns were met with.

German South-west Africa.—At the tenth meeting of German geographers (Stuttgart, April 1893), Dr. A. Schenck of Halle read a paper on the orographical and geological features of German South-west Africa. He has found that Damaraland and Great Namaqualand—which are composed of mountain ranges gradually sloping down towards the Kalahari desert—principally consist of two formations, viz., of granite and gneiss, and of the so-called table-mountain formation. The latter forms peculiarly-shaped sandstone mountains, which are of sedimentary origin. They usually appear in the form of broad prisms and truncated cones, and are probably the remnants of former uninterrupted plateaux, which have gradually disappeared through erosion. Near Angra Pequeña the Table Mountains commence not far from the coast, a little east of Aus, and extend to the Fish River and its tributaries. Here they form the Huib and Han-ami plateaux. These mountains consist not only of sandstone, but also of clay slates, quartzites, etc. To the south extend the plateaux of the Orange River. In Damaraland the gneiss and granite formations prevail, and the Table Mountains gradually narrow. As regards decomposition the Table Mountains are much less under the influence of denudation than are the granite and gneiss formations. Winds, especially the south-west winds near the coast, are an important factor in forming and transforming the orographical features of German South-west Africa.

The Algerian Sahara.—M. G. Rolland reports to the Geographical Society of Paris the results of his work at Hassi-Inifel in the extreme south of Algeria,

93 miles south-east of El-Golea in the upper part of Wed Mya a little before its junction with Wed Insokki. An expedition in 1881 dug a second well in the bed of the valley to the depth of 20 feet, but the yield of water was barely half a gallon a minute. Hassi-Inifel is not near any of the caravan routes, but it is one of the strategic points between El-Golea and Insalah. A letter from El-Golea (January 16th, 1893) reports that the borings at Hassi-Inifel were proceeding with great ease in a soft soil, but that no trace of water was found at a depth of 114 feet. M. Rolland, while protesting against the ideas formed by the success of previous borings at Wed Rir, Wargla, and El-Golea, considers that Hassi-Inifel is one of the best points to select for these experiments, but he does not think a flowing supply can be got unless the borings are extended to a depth of 1000 feet.

Commercial Condition of Suakin.—From the report on the trade and commerce of Suakin for 1892 recently issued, we learn that during the year there was a decrease in the import trade with the exception of timber, while the export trade had largely increased. The exports from Suakin include gum, senna, the best quality of which comes from the north (near Rowayah), mother-of-pearl, found near Mersa Halaib (lat. 23° N.), where also pearls are occasionally obtained, ivory, and, for the first time for many years, cotton, although of an inferior quality to that grown in Lower Egypt, the greater portion of which was exported to Egypt and India in an uncleaned condition, that sent to other countries being cleaned by hand in Suakin. The Tokar cultivation is dependent upon the course of the Baraka flood, which commences at the end of July or beginning of August. A large quantity of salt was also extracted last year from the salt-pans at Rowayah (lat. 21° N.), the greater part being sent to Bombay. Minerals have been found in the mountains of Erkoweit, as also in the Erba Mountains to the north. Suakin possesses a land-locked and commodious harbour, approached by a narrow passage between the reefs, which requires great care in navigating. The present population of Suakin is estimated at about 11,000. The principal cultivation is the melon-plant; the date-palm is also said to grow well. The wild-fig grows at Suakin, Sinkat, and Erkoweit. Rain is said to have fallen last year in July. The hot season broke early in November. The maximum shade-temperature for the year was 114° Fahr., the minimum 66° Fahr.

Types of Fortification in Africa.—Dr. L. Hösel deals with this subject in a recent number of *Globus* (vol. 63, No. 9). Although some tribes in Africa retire before their foes to inaccessible retreats, as a general rule the inhabitants guard against hostile attacks by defensive measures. These consist (1) in making access to their settlements as difficult as possible; and (2) in surrounding the same by protective ramparts. The forest-clad regions afford the fullest scope for the former method, by concealment and circuitous approaches; barriers, pitfalls and stakes being used to make the approach dangerous to a foe. In open country villages are placed on steep hills, and the entrances are made as low and narrow as possible (*e.g.* Taveta), and closed by wooden doors barred on the inside. Surrounding ramparts may be either walls, palisades, or hedges. The first are seldom of stone (rare instances are mentioned by Barth and others). Clay walls are the rule, and are found chiefly in the northern half of the continent, which has been subject to foreign influence, palisades, etc., taking their place further south. Those of Kuka are 20 feet high, and those of Kano as much as 65 feet. They are sometimes double, and owing to diminution of population or other causes, a smaller space is sometimes (as in the case of the capital of Baghirmi) walled in within the original area, which may have included a wide extent of fields, etc., the outer wall then falling into decay. Several concentric circles are sometimes seen, especially in Upper

Guinea, and their protective power is increased by masses of thorns at the top. The palisade may be replaced by barricades of thorns or by living hedges of the same, affording an excellent protection against arrows. Hedges of Euphorbia, whose poisonous juice adds to its effectiveness, are much used in East Africa.

Central African Place-Names.—Mr. D. Crawford, in his diary, now being published in *Echoes of Service*, points out that the greater number of the names given on maps of Central Africa are positively erroneous, while others have only a very remote likeness to the real names as used by the natives. "For instance," he says, "the Koni mountains, reputed to be on the east side of the Lufira River, do not exist, there being only one mountain of that name—a peak—about 20 miles south of the old capital on the road to Ntenke's and west of the Lufira. The Viano or Mitumbwa mountains sounds very strange, 'Mitumba' being the plural of 'mountain,' and 'Viano' meaning prairie land or plains. Regarding 'Ourowa,' it seems almost incredible that this is intended for the great Luba country, which, while it extends to the Luapula River, is by no means limited to the small portion assigned to it on the map. 'Iramba' is the Lamba country. Bun Keya is the name of the old capital. 'Kundehungen,' as applying to the great range on the east of the Lufira, requires a word of explanation. It strictly refers to the top of the range, which is a great prairie stretching on to the Luapula, and means 'there at the prairie.'"

AMERICA.

Documents relative to Behring's Expedition.—The Government of the United States having asked the Russian Government to send to the Chicago Exhibition all documents "relative to the journey of Captain-Commander Vitus Behring in 1738–1742, during which journey Alaska was discovered," the Russian authorities have done their best to discover such documents. The reports relative to this second expedition of 1741, made on board the packet-boat *St. Peter*, could evidently not be in Behring's handwriting, as the illustrious traveller died on December 8th, 1741 (o.s.). The report was written by Lieut. Waksell, and, together with a map and the log-book of the *St. Peter*, it was forwarded to the Russian Admiralty, as well as the report of Capt. Chirikoff, who was in command of the packet-boat *St. Paul*, under Behring. Waksell's reports were received safely at the Admiralty, and happily were copied there several times; but the originals have disappeared. It is supposed that they were sent in 1754 to Irkutsk, whence they were forwarded in 1759 to Tobolsk. There they must have been destroyed during the conflagration of 1788. As to the copies, the following have been found: (1) Two copies of the log-book of the *St. Peter* for the year 1741, and two copies of the log-book of the boat which was built on Behring's Island from the wrecked packet-boat, was also named *St. Peter*, and reached Petropavlovsk in 1742; (2) One copy of the chart of Behring's journey to the American coast, compiled from Waksell's report, copied from the original in 1744, and compared with it in 1754; and (3) Three copies of Chirikoff's log-book of the *St. Paul*, for 1741 and 1742, and one copy of his journey to the American coast and to Behring's Island. Moreover, in different bundles, various documents signed by Behring, Chirikoff, and other members of the expedition, were discovered. They relate to the building of the two boats, the *St. Peter* and *St. Paul*, at Okhotsk. The chief document is Chirikoff's report on his journey to the American coast, and an abstract from Waksell's report on the same. The last of Behring's reports was signed on August 29th, 1740—the great captain expressing his confidence in being able to leave for Avacha with the first proper wind. All these documents have been sent to Chicago, together with a printed memoir, in English, summing up the matter, and containing abstracts from the reports.

Dr. Carl Lumholz's Recent Researches in Northern Mexico.—The first number for the present year of the *Bulletin* of the American Geographical Society contains a letter from Dr. Carl Lumholz, in which he gives a brief account of his recent ethnological researches among the little-known Tarahumare Indians of Northern Mexico. These interesting people are for the most part cave-dwellers, although not apparently related with the cave and cliff-dwellers of the United States. They live in the *barrancas*, which resemble gigantic cracks from 3000 to 4000 feet deep, which traverse the Chihuahua portion of the Sierra Madre from east to west. They appear to be entirely untouched by Spanish influence, and follow their own primitive habits and customs. They are said to be extremely timid, small in stature, but well-formed and muscular, very active, and able to endure exertion. On his recent return from the border, towards the State of Durango, Dr. Lumholz ascended the Cerro de Muinora in the southern neighbourhood of Guadalupe y Calvo, probably the highest mountain in Chihuahua. At the time of writing, he was then on his way to Nabogame and Baborigame, where the Tepehuanes Indians live, and from there he intends to extend his researches to the numerous *barrancas* and *arroyos* (streams) that traverse the western part of the Sierra to the north, where the most primitive Tarahumares are to be found.

POLAR REGIONS.

Dr. Nansen's Polar Expedition.—Dr. Fridtjof Nansen with the members of his expedition sailed in the *Fram* from Christiania at half-past twelve P.M. on Saturday, June 24th. Large crowds lined the quays, and bade the explorers a hearty farewell. The expedition, as is known, intends to attempt to cross the North Polar area by making for the New Siberian Islands, and getting into a current which Dr. Nansen believes drifts across the Arctic region in the direction of Greenland. The *Fram* will call at Bergen and one or two other ports in Norway for the purpose of taking in supplies; she will be provisioned for five years. Whatever may be thought of the theories on which Dr. Nansen has based his plans, and however foolhardy the venture may appear to many, everyone must wish these worthy descendants of the hardy Norsemen of yore the success they deserve.

The Antarctic Whalers.—The *Balæna* and *Active* returned to Dundee in the beginning of June, well-laden with sealskins and oil. The reports promised by the captains and surgeons have not yet reached the Society, but they are expected to be ready for publication in next month's *Journal*. Until the full reports reach us it would be inadvisable to give an opinion as to the geographical value of the observations made. The *Balæna* did not apparently cross the Antarctic circle, but the numerous sketches made Mr. W. G. Burn Murdoch, the artist who accompanied her, will doubtless be a valuable contribution to our knowledge of the scenery of the southern ice. The *Active* appears, from the newspaper reports, to have done a little exploration, and her captain, Mr. Robertson, believes that he discovered new land, to which he has given names, taken mainly from the neighbourhood of Dundee and the owners and managers of the whaling vessels. No positions have as yet been made public. Dr. Donald, on the *Active*, and Mr. Bruce, on the *Balæna*, took a number of photographs, and meteorological observations were carried on whenever the captains considered that it would not hinder the primary object of the voyage to permit them. Collections of plants and animals were also made by the surgeons subject to the same restrictions.

GENERAL.

Railways as a Test of Progress.—An extra bulletin has been issued from the Census Office, Washington, prepared by Mr. H. C. Adams on the railway

mileage of the world in 1890. The bulletin contains tables of statistics and results reduced to diagrammatic form. From these statistics Mr. Adams notes that out of a total of 370,281 miles of railway for the whole world, North America and Europe claim 319,802 miles; and even the mileage of Asia, South America, Africa, and Australasia is due to European efforts. He observes also that English-speaking peoples are responsible for the construction of more miles of railway than all other peoples combined. The United States contains 163,597 miles of railways, nearly half that of the whole world; no other country has progressed so rapidly in this respect, new railways being often demanded by the necessity of opening up land before settlement was possible. For the total mileage the United States easily heads the list; then comes Germany (25,969), France (22,586), Great Britain (19,939), and Russia (18,728); Persia with 11 coming last. In regard to railway mileage per 100 square miles of area, Belgium comes first with 28·23 miles of railway; Great Britain (16·42), the Netherlands (13·73), and Germany (12·44) follow; the United States comes eleventh with 5·51, while West Australia, which heads the list of mileage in proportion to inhabitants, has only 0·05 mile of line to every 100 square miles of territory. South America stands out as the most backward of all the continents claiming a European civilisation; the average mileage per 100 square miles of territory is only 0·24. In the table representing the proportion of miles of line per 10,000 inhabitants, the Australian Colonies occupy the first places—Western Australia has 112·95, South Australia 54·23, Queensland 50·69, Canada 30·35, New Zealand 28·78, United States 25·90, Tasmania 24·83, Asiatic Russia 20·70. Great Britain is twenty-third on the list with 5·17. The second group of tables also includes three diagrams, showing the growth of mileage from 1830 to 1890, the proportion to 100 square miles, and to 10,000 inhabitants. They refer exclusively to the United States, and to facilitate comparison the States are divided into ten groups. In the New England group more than half the present mileage was reached by 1860; in the Pennsylvanian group the mileage has increased with equal rapidity during each decade since 1860—this regular increase being due to increasing trans-continental traffic seeking an outlet to foreign countries. The Southern and Gulf States show a great increase during 1850–1860, and again between 1880–90, showing how the war arrested internal improvement in the south for nearly twenty years. The groups tributary to Chicago and St. Louis have increased more rapidly each decade. They now contain 66,500 miles of line, while in 1870 there were little more than 1600 miles constructed. The extremes in proportion to area are the Ohio group (20·93 miles of line to every 100 square miles of country) and the Californian group (1·61). In regard to inhabitants, the Wyoming group has 68 miles to every 10,000 inhabitants; while for the whole of the United States the average is 26·66 as against 3·84 for Europe. No doubt this difference is largely due to the greater density of European populations; but it also points to superior energy on the part of the Americans, since in the States there are 5·51 miles of line to every 100 square miles of land, and for the whole of Europe the percentage is only 3·62.

Origin and Distribution of Cannibalism.—While some writers have attributed the origin of cannibalism to religious motives, H. Henkenius (*Deutsche Rundschau*, vol. xv., p. 348) considers that hunger was the original incentive to the practice, which was afterwards persisted in from choice, the superstitious and religious aspects being later developments. Cannibalism seems to have prevailed to a considerable extent among the primitive inhabitants of Europe, and still more in America. The fact that no traces of it have been found dating back to palæolithic times, while the lower animals rarely devour their own

species, seems to show that a certain degree of intelligence was first attained. (With this may be compared the remark of Peschel that the custom is most prevalent among tribes distinguished by a certain social advance, such as the Monbuttu.) An enumeration is given of the various cannibal tribes in different quarters of the world at the present day, the probable motive in each case being indicated. While instances of resort to human flesh as food in times of famine are widely diffused, the most common motive seems to be the well-known superstition that by eating the heart or other part of an enemy—to which the practice is often restricted—his prowess is acquired. The almost entire freedom of Continental Asia from the vice is noteworthy. In Polynesia and in Central America it occurs most frequently in connection with religious rites. In the former region special preference is given to the eye of the victim. Human sacrifices, however, do not always lead to cannibalism, *e.g.*, not in Dahomé. While in many cases the flesh of relatives especially is eaten, this was viewed with abhorrence among the Maoris, who also forbade human flesh to women. Many tribes that were formerly addicted to the vice have now abandoned it, principally owing to the spread of Christianity.

The Russian Geographical Society's New Undertakings.—During the present summer the Russian Geographical Society is sending out the following expeditions:—Professor Krotoff will pursue the oro-geological exploration of the western slopes of the Urals in the southern part of Perm. The further study of the great magnetic anomaly at Bielgorod (Kursk) will be continued by Mr. Rodd. M. Iversen will make a series of pendulum measurements about Moscow, where a remarkable disturbance has been noticed, and M. Sokoloff will take the Society's pendulum apparatus to Berlin and Paris, in order better to connect the Russian measurements with those made in Western Europe. Herr Fritsche will make magnetic measurements in South Russia. In the domain of ethnography the chief expedition will be that of MM. Istomior and Liapunoff, who will visit various provinces of East and North-East Russia to collect folk-lore documents, and songs. M. Dobrotvorsky will begin the study of the manners and language of the Tsiganes of Smolensk. MM. Wolter, Hinken, and Pogodin will continue their Lithuanian studies; MM. Pyevin and Lyeskoff will make ethnographical researches in Olonetz, and M. Peretz in the Government of St. Petersburg. The two great expeditions of M. Potanin in West China, and MM. Roborovsky and Kozloff in Tibet are the chief undertakings in Asia.

CORRESPONDENCE.

The Orthography of Geographical Names.

HAMBURG, *May 27th*, 1893.

In the May number of *The Geographical Journal* was published a very able review of my pamphlet on this subject, by Lieut.-Colonel J. C. Dalton. Though in most points the sense of my proposals has been rendered very accurately, there are some misunderstandings which appear grave enough to render a few corrections necessary.

Page 432, Principle B., *read*, instead of "disregarding," "preserving."

Page 433, line 12 from below, *omit* "or aspirated."

Ibid. Rule 5, *read*, "all that bears on traditional orthography must be given with large initials, the phonetic rendering with small ones. Thus, for example, Kiyef (*Kiew*), Futshau (*Foochow*), where the word in brackets shows the traditional

orthography, and Kew (*kyu*), Chieti (*kiéti*), Ceuta (*thé-uta*), where it gives the pronunciation."

Page 434, Rule 7, C., *read*, "when their casual omission will not render the pronunciation unrecognisable, but only less exact." The reason of this proposal is, that we must expect an omission of these signs in publications of less scientific character, such as newspapers, etc.

Page 435, Rule 10, *read* "indispensable only"; and for "would be used," *read* "might be omitted."

Ibid. Rule 12, for "speaking generally," *read* "whenever transcription is aimed at" (*viz.*, in cases not reserved for the historical orthography by Rule 1).

I am far from being an authority in phonetics. My object was simply to assist in the general introduction of the system of the Royal Geographical Society and others derived from it afterwards, by a modest re-adjustment of it on the basis of the doctrine of sounds. Surely phoneticists like Mr. Sweet and Miss Soames and others will judge my system a very crude and purely practical one, and such it must be for the given purpose. It suffices, if it is not a false one. It does not differentiate any sound, or group of sounds, which is not already clearly indicated on most of the existing European charts for *some part* of the world, only it aims to make such designations general for *all* parts, *as far as there exists no well-established historical orthography in Roman letters.* In view of the innumerable existing systems of transcription it takes the rules of the Royal Geographical Society as a firm basis, and the improvements, which it proposes on these, are relatively few and far from being complicated and ideal. In quoting geographical names from Western Europe, I do not propose any change in their historical spelling, but only, for school-books, etc., the addition of their pronunciation (in brackets, with small initials), and the adoption, for *this* purpose, of the *same* system, which will be adopted for the writing of African, etc., names. It is clear that this would facilitate the introduction of a more correct pronunciation of geographic names in schools, and among the educated public in general.

DR. W. KÖPPEN.

The Editor of *The Geographical Journal.*

MEETINGS OF THE ROYAL GEOGRAPHICAL SOCIETY, SESSION 1892-93.

Special General Meeting, April 24th, 1893.—The Right Hon. Sir MOUNTSTUART E. GRANT DUFF, G.C.S.I., F.R.S., President, in the Chair.

THE Meeting was summoned by the Council by the following notice, which was sent to all Fellows in Great Britain:—

The Council give notice that a Special General Meeting will be held at 5 P.M. [subsequently altered to 4.30 P.M.] on April 24th next, in the Hall of the University of London, Burlington Gardens, W. (by permission of the Senate), the Right Hon. Sir Mountstuart E. Grant Duff, G.C.S.I., F.R.S., &c., President, in the Chair, to consider the following proposal, which has been made by Admiral Sir E. Inglefield and five other Fellows, in accordance with Chapter V., Section 2 of the Regulations:—

> "That the following new Regulations be added to the existing Regulations of the Society, namely, Chapter II., Para. 5A.:—'Ladies may be elected as

Ordinary Fellows, but shall not be eligible to serve on the Council or in any of the Offices of the Society.'

"Chapter VII., Interpretation Clause:—'Wherever required in these Regulations or the Appendix thereto, words importing the masculine gender only shall include the feminine gender.'"

(Signed) D. W. Freshfield.
H. Seebohm.

The first new Regulation was moved by Admiral Sir E. Inglefield, and seconded by General Sir Owen T. Burne.

The following amendment was proposed by Lord Aberdare, and seconded by General R. Strachey:—

"That all the words in the Resolution just moved after 'Fellows' be left out."

This was negatived by 147 to 105.

Admiral Sir E. Inglefield then withdrew both the Resolutions of which he had given notice.

An amendment to the original Resolution was moved by Admiral J. Halliday Cave to the following effect:—

"1st. Ladies may be elected as Honorary Fellows of the Society;

"2nd. That the number of the Honorary Fellows may be increased from forty (the present restricted number) to one hundred."

This was seconded by Mr. William Coward, but was withdrawn.

The President thereupon stated to the Meeting that, in view of the result of the vote that had been taken, he should think it his duty to advise the Council to refrain from the further election of ladies.

The Anniversary Meeting, May 29th, 1893.—**The Right Hon. Sir Mountstuart E. Grant Duff, G.C.S.I., F.R.S., President, in the Chair.**

At the commencement of the proceedings, the Honorary Secretary (Mr. Douglas W. Freshfield) read the rules which govern the business of the Anniversary Meetings; the minutes of the last Anniversary Meeting, May 23rd, 1892, those of the Special General Meetings of November 28th, 1892, and April 24th, 1893.

The President next appointed Mr. J. S. Dyason and Mr. R. A. McLean scrutineers for the ballot about to take place.

The Annual Report of the Council was then presented and taken as read.

REPORT OF THE COUNCIL.

The Council have the pleasure of submitting to the Fellows the following Report on the general and financial condition of the Society:—

Membership.—The question of electing ladies as Ordinary Fellows was considered by a Special General Meeting on April 24th, when it was decided in the negative by a considerable majority. The Council regard this vote (unless hereafter rescinded by a General Meeting) as conclusive against any further election of ladies as Ordinary Fellows, without prejudice to the *status* of those already elected. They consider that, under the circumstances, all the legal expenses incurred in connection with this important question may equitably be defrayed by the Society, and they have accordingly provided for their being so defrayed.

The number of Fellows elected during the year ending April 30th, 1893, was 326, not including 22 ladies, and three Honorary Corresponding Members. In the previous year, 1891–92, the total elections amounted to 193, and in 1890–91 the number was 237. Our losses have been, by death 80 (besides 2 Honorary Corres-

ponding Members), by resignation 44, and by removal on account of arrears of subscription 58; making an increase for the year of 144 male Fellows besides 22 ladies. In the year 1891–92 there was a decrease of 23; in 1890–91 an increase of 84. The total number of Fellows on the list (exclusive of Honorary Members, but including ladies) on May 1st was 3691. There has been no such increase since 1875, when the net additions reached 202.

Finance.—As will be seen by the annexed Balance Sheet, the total net income for the Financial year ending December 31st, 1892 (*i.e.* exclusive of balance in hand) was 9299*l.* 18*s.* 7*d.*, of which 7007*l.* consisted of entrance-fees and subscriptions of Fellows. In the previous year, 1891, the total net income was 8322*l.* 16*s.* 8*d.*, and the amount of subscriptions, &c., 6067*l.*; in 1890 the two totals were 9531*l.* 16*s.* 2*d.*, and 7053*l.* respectively.

The net expenditure for the past year (*i.e.* exclusive of balance in hand) was 9012*l.* 7*s.* 5½*d.* The net expenditure in 1891 was 8171*l.* 3*s.* 9*d.*; in 1890, 8218*l.* 5*s.* 10*d.*

The Finance Committee of the Council have held, as usual, Meetings during the year, supervising the accounts of the Society. The Annual Audit was held on April 14th last, the Auditors being, on behalf of the Council, Sir Rawson W. Rawson and S. W. Silver, Esq., and on behalf of the Fellows at large, E. O. Tudor, Esq., and J. Duncan Thomson, Esq. The cordial thanks of the Council and Fellows are due to these gentlemen for having freely devoted their valuable time to this important task. At the end of their labours the Auditors drew up the following Report to the Council:—

Auditors' Report.—"The Auditors appointed for the examination of the Accounts of the Royal Geographical Society for the year ended December 31st, 1892, have examined the Balance Sheet submitted to them, and having compared it with the books and vouchers, have found it correctly stated and sufficiently vouched. The Accountant has kept and rendered the same in the usual commendable manner.

"The financial results of the year are in every respect satisfactory and encouraging. The receipts (9300*l.*) have almost equalled those of 1890 (9532*l.*), which were exceptionally swollen by the public reception of Mr. H. M. Stanley on his return from Africa, and they have exceeded either of the years 1889 or 1891 by 1076*l.* The expenditure (9012*l.*) exceeds that of 1891 by 841*l.*, leaving a balance on December 31st of 558*l.*, which is more than double that of 1891.

"The excess in the expenditure is distributed over the general expenses of the Establishment (257*l.*), and the meetings, 500*l.* The latter is accounted for by the revival of the Annual Dinner, and the Conversazione at South Kensington, and by the new arrangements for the reception of Fellows after the Ordinary Evening Meetings.

"There appears to be no reason to doubt that, looking to the changes recently made in the charge for Entrance Fees and Life Compositions, such an increase of expenditure as that of last year will in future be fully met.

"For the purpose of future comparison with the cost of Publications under the recent change in their form it may be useful to record the cost thereof and the proceeds of sales and advertisements during the last three years, and it will be satisfactory to show that in the year 1892 the increase in the sales and advertisements has much more than covered the small increase in the cost of production and circulation.

	Cost.	Proceeds of sales and advertisements.	Increase of Cost.	Increase of Sa'e.
	£	£	£	£
1890	2753	557	—	—
1891	2818	584	65	27
1892	2846	663	28	79

"The arrears of Subscription, valued last year at 467*l.*, have increased this year to 558*l.*

"The Investments remain unchanged. The details follow:—

SOURCE.

	£	s.	d.
Davis bequest	1800	0	0
Murchison bequest	1000	0	0
Gill Memorial	1028	5	6
Peek Grant	1000	0	0
Back bequest	561	0	8
Trevelyan bequest	510	4	0
Miscellaneous	15,519	2	2
	£21,418	12	4

NATURE.

	£	s.	d.
North-Eastern Railway 4 per Cent. Debenture Stock ..	1000	0	0
Great Indian Peninsular Railway 5 per Cent. Stock ..	4850	0	0
Great Western Railway 4½ per Cent. Stock (Davis bequest)	1800	0	0
London and North-Western Railway 4 per Cent. Stock (Murchison bequest)	1000	0	0
Caledonian Railway 4 per Cent, Preference Stock ..	2000	0	0
New Zealand 4 per Cent. Stock	1000	0	0
Norwegian 4 per Cent. Bonds	1000	0	0
New South Wales 3½ per Cent. Stock (Gill Memorial) ..	1028	5	6
India Stock	1000	0	0
India 3½ per Cent. Debentures	1000	0	0
Consols	3669	2	2
„ (Peek fund)	1000	0	0
„ (Back bequest)	561	0	8
„ (Trevelyan bequest)	510	4	0
	£21,418	12	4

"The present value of the above Stock was estimated in March last at 27,069*l.* 12*s.* 3*d.*, showing an increased value of 533*l.* 3*s.* 7*d.*, without any change in the nominal amount.

"RAWSON W. RAWSON,
"S. W. SILVER,
"J. D. THOMSON,
"E. O. TUDOR, } *Auditors.*

"*April* 14*th*, 1893."

A statement has been submitted by Sir Rawson W. Rawson, showing the proportion of Life Compositions to Annual Subscriptions in each of the last twenty-one years, with a result that the amount invested has exceeded the amount which should properly have been set aside during that period in respect of Life Compositions.

The following Balance Sheet and Statement, showing the Receipts and Expenditure of the Society from the year 1848 up to the present date, are annexed to the Report of the Auditors:—

BALANCE SHEET FOR THE YEAR 1892.

Receipts. *Expenditure.*

1892.	£	s.	d.	£	s.	d.	1892.	£	s.	d.	£	s.	d.
Balance in Bankers' hands Dec. 31st, 1891 .	260	8	4				*House* :—						
Do. Accountant's do.	10	2	10½				Taxes and Insurance..	98	18	0			
				270	11	2½	Repairs and Furniture	154	7	11			
Subscriptions :—							Coals, Gas, and Water	81	10	2			
Arrears..	280	0	0				Miscellaneous	164	7	2			
For the current year ..	4052	0	0								499	3	3
Paid in advance	776	0	0				*Office* : —						
				5108	0	0	Salaries and Gratuity..	1010	13	4			
Entrance Fees	..	..		747	0	0	Stationery and Printing	387	14	3			
Life Compositions.. ..	..	..		1152	0	0	Miscellaneous	275	16	1			
Parliamentary Grant ..	..	..		500	0	0					1674	3	8
Royal Premium	..	..		52	10	0	*Library* :—						
Rent of Shop	..	..		43	0	0	Salaries..	292	10	0			
							Purchase of Books ..	94	19	7			
Publications :—							Binding	108	16	3			
Sale of Publications ..	474	9	5				Miscellaneous	131	2	5			
Advertisements in 'Proceedings'	189	10	0								627	8	3
				663	19	5	*Map-Room* :—						
Payments for Scientific Instruction	..	..		41	7	6	Salaries	450	0	0			
Payments made in error, &c.	..	..		63	17	7	Purchase of Maps and Diagrams..	29	11	8			
Loan of Diagrams and Slides	..	..		9	1	0	Instruments and Repairs	227	13	0			
Sale of Soiree Tickets ..	..	..		25	5	0	Miscellaneous	147	10	0			
											854	14	8
Dividends :—							*Map-Drawing-room* :—						
North-Eastern Railway 4 per Cent. Debenture Stock.. .. 1000*l*.	39	0	0				Salaries	350	0	0			
Great Indian Peninsula Railway 5 per Cent. Stock .. 4850*l*.	322	14	8				Miscellaneous	15	4	0			
Great Western Railway 4½ per Cent. Stock [Davis bequest] 1800*l*.	74	11	9								365	4	0
London and North-Western Railway 4 per Cent. Stock [Murchison bequest] 1000*l*.	39	0	0				*Meetings* :—						
Caledonian Railway 4 per Cent. Preference Stock .. 2000*l*.	78	0	0				Evening Meetings ..	327	17	6			
Norwegian 4 per Cent. Bonds .. 1000*l*.	39	0	0				Anniversary Dinner ..	58	10	0			
New Zealand 4 per Cent. Stock 1000*l*.	39	0	0				Soirée at South Kensington	290	8	0			
New South Wales 3½ per Cent. Stock [Gill memorial] 1028*l*. 5*s*. 6*d*.	35	1	10				Miscellaneous	114	5	4			
India Stock .. 1000*l*.	31	13	8								791	1	1
India 3½ per Cent. Debentures .. 1000*l*.	34	2	8				*Medals and other awards*	..	..		283	6	6
Consols 3669*l*. 2*s*. 2*d*.	98	7	8				*Scientific Purposes and Education* :—						
„ [Peek fund] 1000*l*.	26	16	4				Scientific Instruction..	68	5	0			
[Back bequest] 561*l*. 0*s*. 8*d*.	15	1	0				Oxford University (Readership)	150	0	0			
„ [Trevelyan bequest] 516*l*. 4*s*. 0*d*.	13	13	4				Oxford University (Studentship)	75	0	0			
Interest on 1000*l*. deposited to Oct. 4th, 1892	7	15	2				Owens College (Council Grant)	50	0	0			
				893	18	1	Houssa Association ..	30	0	0			
							Publications :—				373	5	0
							Printing Monthly 'Proceedings'	1138	1	0½			
							Printing 'Supplementary Papers' Vol. III., Part 2	86	17	2			
							Maps and Illustrations for 'Proceedings' ..	817	3	7			
							Postage of Monthly 'Proceedings'	312	0	5½			
							Payments to Contributors, Translations, &c...	204	0	8			
							Editor of Publications	200	0	0			
							Miscellaneous	88	0	3½			
											2846	2	6½
							Payments in error returned	..	..		43	8	6
							Grant towards International Geographical Congress	..	..		100	0	0
							Expeditions and aid to Travellers :—						
							Grant to Mr. A. E. Pratt	100	0	0			
							Grant towards Dr. Nansen's Polar Expedition	300	0	0			
							Grant towards Antarctic Whaling Expedition (Instruments)..	154	10	0			
											554	10	0
							Balance in Bankers' hands Dec. 31st, 1892	546	19	2			
							Do. Accountant's do.	11	3	2			
			£	9570	9	9½				£	9570	9	9½

E. L. S. COCKS,
Treasurer.

Audited and found correct, April 14th, 1893.

RAWSON W. RAWSON,
S. W. SILVER,
J. D. THOMSON,
E. O. TUDOR,
Auditors.

STATEMENT showing the RECEIPTS and EXPENDITURE of the Society from the Year 1848 to Dec. 31st, 1892.

	Year.	Cash Receipts within the Year.	Cash Amounts invested in Funds.	Deducting Amounts invested in Funds; actual Expenditure.
		£ s. d.	£ s. d.	£ s. d.
[1]Includes Treasury Grant of 1000*l.* for the East African Expedition.	1848	696 10 5	.. ..	755 6 1
	1849	778 3 0	.. ..	1,098 7 6
[2]Includes Treasury Grant of 2500*l.* for the East African Exped tion.	1850	1,036 10 5	.. ..	877 2 10
	1851	1,056 11 8	.. ..	906 14 7
	1852	1,220 3 4	.. ..	995 13 1
[3]Includes Legacy of Mr. Benjamin Oliveira, 1506*l.* 17*s.* 1*d.*	1853	1,917 2 6	.. ..	1,675 6 6
	1854	2,565 7 8	.. ..	2,197 19 3
	1855	2,584 7 0	.. ..	2,636 3 1
[4]Includes Legacy of Mr. Alfred Davis, 1800*l.*	1856	[1]3,372 5 1	533 10 0	2,814 8 1
	1857	3,142 13 4	378 0 0	3,480 19 9
[5]Includes Legacy of Sir Roderick Murchison, 1000*l.*	1858	3,089 15 1	.. ..	2,944 13 6
	1859	3,471 11 8	950 0 0	3,423 3 9
[6]Includes Mr. James Young's Grant for Congo Expedition, 2000*l.*	1860	[2]5,449 12 1	466 17 6	5,406 3 7
	1861	4,792 12 9	1,358 2 6	3,074 7 4
	1862	4,659 7 9	1,389 7 6	3,095 19 4
[7]Includes 1009*l.* 14*s.* 6*d.* sale of Exchequer Bills.	1863	5,256 9 3	1,837 10 0	3,655 4 0
	1864	4,977 8 6	1,796 5 0	3,647 7 10
[8]Includes Mr. James Young's Grant for the Congo Expedition, 1041*l.* 14*s.*	1865	4,905 8 3	1,041 5 0	4,397 4 5
	1866	5,085 8 3	1,028 15 0	4,052 15 0
	1867	5,462 7 11	1,029 0 6	3,943 17 4
	1868	5,991 4 0	1,857 3 9	4,158 17 10
[9]Includes Parliamentary Grant of 3000*l.* to Cameron Expedition.	1869	[3]6,859 16 0	2,131 5 0	4,646 0 8
	1870	[4]8,042 6 1	3,802 6 0	3,845 10 6
[10]Includes Donation of 500*l.* by Mr. C. J. Lambert.	1871	[5]6,637 3 7	1,000 0 0	3,728 4 4
	1872	[6]8,119 7 9	1,999 4 6	5,871 13 2
	1873	[7]7,761 18 10	2,015 1 8	6,697 12 6
[11]Includes Legacy of Admiral Sir George Back, 540*l.*	1874	[8]8,753 5 10	499 0 0	7,876 2 3
	1875	7,934 15 10	2,002 7 6	5,683 4 16
[12]Includes Legacy of Sir W. C. Trevelyan, 500*l.*	1876	[9]11,611 11 8	.. ..	6,870 13 1
	1877	[10]7,950 1 11	2,538 2 0	8,940 17 11*
	1878	[11]8,124 10 0	3,000 0 0	6,361 9 6
[13]Includes 1005*l.* 8*s.* 2*d.*, sale of Exchequer Bills.	1879	[12]8,979 14 10	1,551 10 10	6,990 14 2
	1880	8,599 18 4	1,567 5 1	8,454 1 10†
	1881	8,809 19 5	.. ..	8,362 5 6‡
[14]Includes 1000*l.* received from Mr. B. Leigh Smith.	1882	[13]8,942 15 0	.. ..	8,779 10 7
	1883	[14]9,599 9 0	1,001 5 0	8,624 2 11
[15]Includes 500*l.* on loan from Bankers.	1884	[15]8,964 11 7½	.. ..	9,266 0 5
	1885	[16]8,738 12 3	.. ..	8,555 3 10½
[16]Includes 998*l.* 0*s.* 10*d.*, sale of India Debentures.	1886	[17]7,968 9 0	1,000 0 0	7,767 18 0½
	1887	8,007 16 3	.. ..	8,493 10 3
[17]Includes Donation of 1000*l.* from Miss Gill.	1888	8,053 5 0	.. ..	7,903 18 6
	1889	8,224 7 7	1,000 0 0 On deposit.	7,025 15 10
	1890	9,531 16 2	850 0 0	8,218 5 10
	1891	8,322 16 8	1,000 0 0	8,171 3 9
	1892	9,299 18 7	.. ..	9,012 7 5½

* This sum includes the Special Parliamentary Grant transferred to the Cameron Expedition Fund in February 1877.

† This amount includes the payment of two sums of 500*l.* each, contributed to the African Exploration Fund in this and the previous year.

‡ This sum includes the payment of 102*l.* 8*s.* to the African Exploration Fund; also 714*l.* 9*s.* 1*d.*, the final payment for Cameron Expedition Fund.

STATEMENT OF ASSETS—December 31st, 1892.

	£	s.	d.
Freehold House, Fittings, and Furniture, estimated (exclusive of Map Collections and Library insured for 10,000*l.*)	20,000	0	0
Investments (amounts of Stock), as detailed in the above Report of the Auditors valued April last at	27,069	12	3
Arrears due on December 31st, 1892, £1395. Estimated at	558	0	0
Balance at Bank £546 19 2			
„ in Accountant's hands 11 3 2			
	558	2	4
Total	£48,185	14	7

Publications.—The monthly *Proceedings* have been issued with regularity throughout the year; the twelve numbers for 1892 forming a volume of 926 pages, illustrated by 30 maps and 16 illustrations. The total cost of the edition of 5000 copies (including 312*l.* 0*s.* 5½*d.* for free delivery to Fellows and Institutions) was 2759*l.* 5*s.* 4½*d.* From this is to be deducted the amount of 663*l.* 19*s.* 5*d.* received from sale of copies to the public and from advertisements. The sum of 86*l.* 17*s.* 2*d.* was expended on 'Supplementary Papers.'

Library.—During the past year 706 books and pamphlets, in addition to serial publications, have been added to the Library; 541 by donation, and 165 by purchase; 300 pamphlets have been put in covers by the Society's map-mounter, and 256 volumes have been bound.

The sum of 141*l.* 14*s.* 3*d.* has been spent in purchasing books, and the further sum of 74*l.* 6*s.* in binding for the Library.

Library Catalogue.—The third supplement to the Authors' Catalogue, containing the titles of all works added to the Library in the years 1881–1890, has been completed, and is ready for printing, and a comprehensive Subject Catalogue is in active preparation. All accessions to the Library are now indexed in the *Geographical Journal* in such a manner as to present monthly a classified record of the most recent literature in all departments of geographical science.

Scientific Purposes Grant.—During the past year 24 intending travellers have received instruction from Mr. Coles in Practical Astronomy, in the Society's Observatory, and in route surveying with the theodolite, prismatic compass, and plane-table, in the country, and 220 hours have been devoted to teaching.

Instruments to the value of 475*l.* 1*s.* 6*d.* have been lent during the past year to the following travellers:—Captain F. R. Maunsell, R.A. (Euphrates Valley, Persia, &c.), 64*l.* 8*s.* 6*d.*; Mr. G. B. Grundy (Bœotia), 18*l.* 18*s.*; Mr. St. G. R. Littledale (Central Asia), 18*l.* 15*s.*; Mr. C. W. Campbell (Korea), 78*l.*; Lieutenant Coningham (Persia), 17*l.* 15*s.*; Captain H. W. Dowding, R.N. (Upper Amazons), 69*l.* 7*s.* 6*d.*; Sir Wm. Macgregor (New Guinea) 87*l.* 13*s.* 6*d.*; Captain H. Picot (I.S.C.) (Central Asia), 10*l.* 10*s.*; Mr. J. C. White (Sikkim), 44*l.*; Mr. Robert M. W. Swan (South-East Africa), 65*l.* 14*s.* In addition to these, a special grant of instruments to the value of 154*l.* 10*s.* was made to the Antarctic Whaling Expedition, 1892.

The instruments lent to the following gentlemen have been returned during the past year, with the exception of those which have been lost:—Mr. F. S. Arnot (Central Africa), 1889; Mr. H. Ridley (Malay Peninsula), 1890; Mr. J. W. Wells (Haiti, West Indies), 1892; Mr. G. B. Grundy (Bœotia), 1892; Mr. A. E. Pratt (South America), 1892; Captain F. R. Maunsell, R.A. (Euphrates Valley, Persia, &c.), 1892; Mr. F. C. Selous (South Central Africa), 1888; Mr. W. M. Conway (Himalayas), 1892.

The following is a list of travellers who still have instruments lent to them in their possession:—Rev. T. Wakefield (East Africa), 1882–83; Mr. W. Deans Cowan (Madagascar), 1883; Mr. E. Douglas Archibald (for cloud observations in England), 1885; Dr. E. J. Baxter (East Africa), 1885; Mr. H. H. Johnston (South-East Africa), 1889; Rev. A. Hetherwick (South-East Africa), 1891; Lieut. B. L. Sclater, R.E. (Mr. H. H. Johnston's Expedition, South-East Africa), 1891; Sir C. M. Macdonald (Niger Region), 1891; Mr. St. G. R. Littledale (Central Asia) 1893; Mr. C. W. Campbell (Korea), 1893; Lieut. Coningham (Persia), 1893; Captain H. W. Dowding, R.N. (Upper Amazons), 1893; Sir Wm. Macgregor (New Guinea), 1893; Captain H. Picot, I.S.C. (Central Asia), 1893; Mr. J. C. White (Sikkim), 1893; Mr. Robert M. W. Swan (South-East Africa), 1893.

Exhibitions in the Map Room.—During the season a series of exhibitions of

photographs, weapons, implements, &c., in connection with papers read before the Society, have been held in the Map Room for several days after each Meeting.

Map Room.—The accessions to the Map Room Collection during the past year comprise 882 Maps and Charts on 1456 sheets; 53 Atlases (including continuations) containing 730 sheets of Maps, 997 Photographs, 354 Lantern Slides. Of these, 42 Maps on 140 sheets, 18 Atlases, 168 Photographs, and 339 Lantern Slides have been purchased. The accessions exceed those of the previous year by 8 Maps, 19 Atlases, 16 Photographs, and 111 Lantern Slides.

The adoption of the Report was moved by General R. STRACHEY and seconded by GENERAL J. T. WALKER.

The rejection of the report was moved by Mr. DIBDIN and seconded by Colonel HORACE MONTAGU. On a vote being taken, it was found that 237 were in favour of the adoption of the report and 144 for its rejection. The report was therefore adopted.

PRESENTATION OF THE ROYAL MEDALS.

The Royal Medals for the Encouragement of Geographical Science and Discovery had been awarded by the Council as follows:—

The Founders' Medal to Mr. FREDERICK COURTNEY SELOUS, in recognition of his twenty years' exploration and surveys in South Africa.

The Patron's Medal to Mr. W. WOODVILLE ROCKHILL, for his travels and explorations in Western China, Koko-nor, Tsaidam, and Tibet, and his observations in the ethnology and languages of the countries visited, published in his work 'The Land of the Lamas,' for the enterprise and intrepidity shown by him, and for his years of study of the native languages to prepare him for these travels.

In presenting the Founders' Medal to Mr. Selous, the PRESIDENT addressed him as follows:—

"Mr. Selous, I have already had the pleasure elsewhere of hailing you as our Medallist-designate, and I now place in your hands the Founders' Medal. You have won it by twenty years of pioneering in a country which was, when you entered it, almost absolutely unknown to Europeans, by a careful study of that country, a study which became always more fruitful as you increased in years and in knowledge, by frequent and generous communication of what you had learnt to this Society, and through it to the whole world, by great services to the empire and to civilisation. We all trust that your contributions to the advancement of science are very far indeed from being ended, and that you will gain fresh laurels in the land where you have already gained so many."

Mr. SELOUS said: Mr. President, Ladies and Gentlemen,—Many years ago I went out to South Africa with the settled determination of making my way into unexplored regions, and I very soon penetrated into little known if not quite unknown parts of the country. At that time I knew absolutely nothing about the Royal Geographical Society; but I very soon made up my mind that to gain as much knowledge as possible concerning the countries in which I was travelling, and to put my notes on record, was a duty which I owed to the country in which I had been born; and I therefore, at a very early period of my wanderings, commenced to make rough sketch-maps of the countries in which I travelled. In 1878 I was fortunate enough to meet with Sir Bartle Frere, on the occasion of his first visit to the Transvaal, and, acting upon his advice, I sent my first maps to the Royal Geographical Society. Since that time I have never ceased to record my routes wherever I have travelled, and I have always sent my work to the Royal Geographical Society. This rough work of an unscientific explorer has always met

with most generous recognition at the hands of this Society. In 1884 I was awarded the Cuthbert Peek Grant, and five years later I was given the Back Premium. Since that time I have spent four more years in Mashonaland and adjacent territories, and during that time I have been enabled to make a careful compass survey of the greater portion of that country; and that the work that I have done has been considered of sufficient value and interest by the President and Council of the Royal Geographical Society to justify them in awarding to me the Founders' Medal for this year has been a source of the most profound satisfaction to me, and I beg to assure you of my very high appreciation of the great honour which has been done to me. This honour is the fulfilment of one of the highest ambitions of my life, and I think I can say that it will give much pleasure to my many friends and well-wishers in far-off Mashonaland. That country now affords a splendid base from which to start upon exploring expeditions into the yet unknown country beyond the Zambesi, and I hope that the knowledge that the Founders' Medal this year has been awarded to myself—I who am so well known in that country, more known perhaps as a hunter and a naturalist there than an explorer—may stimulate many young men in that land to emulate my example, to make sketch-maps of whatever unknown countries they happen to wander into, whether as hunters or as prospectors, and to send the results of their work to a Society which has always shown itself to be so generously appreciative of honest endeavour as has been the Royal Geographical Society. Let me once more assure you of my most high and sincere appreciation of the great honour that has been conferred upon me this day.

In presenting the Patron's Medal to Mr. Henry White, the Acting Minister of the United States, for transmission to Mr. Rockhill, the PRESIDENT said:—Your Excellency,—I have to thank you very warmly in the name of the Royal Geographical Society for honouring our gathering on this occasion as the representative of a great and kindred nation. Had Mr. Rockhill been able to be present in person, it would not have been necessary for me to have taxed your kindness; but he is in America, and I am obliged to ask you to transmit to him our Patron's Medal, with the congratulations of this Society. He has gained it by two long and most arduous journeys in Tibet, one of the least inviting of countries, but one which will present constant temptations to the adventurous traveller till it has given up the last of its secrets.

Mr. Rockhill has not only proved himself an excellent explorer, but, during his residence as a diplomatist in the far East, has earned a reputation as a successful student of Oriental languages. He was good enough to cross the Atlantic recently for the purpose of reading us a paper, and I hope that, if he returns, as seems not improbable, to the regions where he has already done such excellent service to our science, we may frequently hear from him, and receive further enlightenment from the ever-increasing stores of his observation and learning.

Mr. WHITE replied: Mr. President, Ladies and Gentlemen,—I need scarcely say that it has given me the greatest pleasure to respond to your kind invitation, and to attend here to-day to receive this Medal on behalf of my friend and countryman, Mr. Rockhill, to hear the very kind words which you have spoken in reference to him, and the applause with which those remarks have been greeted. I shall not fail to transmit to him every word that you have been kind enough to say, and to report to him the manner in which your remarks have been received. I must also express the great regret which I am sure Mr. Rockhill feels at his inability to be present here to-day; but, after having been for many years an ornament to the service to which I have the honour to belong, he was recently appointed chief clerk of the Department of State at Washington, and it has not been possible for him to leave his duties there in order to visit London for the purpose of receiving the Queen's Gold

Medal which this Society has conferred upon him. I have the honour, therefore, in Mr. Rockhill's absence to express his sincere thanks for the distinction which has been conferred upon him, and to assure you that it will be as highly appreciated by our countrymen as it is by him and by myself.

Other Awards.

The President then announced that the Council had awarded the Murchison and other premia as follows:—

The Murchison Grant for 1893, to Mr. R. W. Senior, who for several years in succession, has carried out a most laborious duty in the higher ranges of Kulu and Lahaul, Punjab Himalayas, and the results achieved in point of accuracy, expedition, and amount of work done, have been exceptional in the face of great hardships and great physical difficulties.

The Gill Memorial, to Mr. Henry O. Forbes, for his Explorations and Natural History Observations in New Guinea, the Malay Archipelago, and the Chatham Islands.

The Cuthbert Peek Grant, to Mr. Charles Hose, for Explorations and Natural History Observations and Collections in Saráwak, Northern Borneo.

Presentation of the Training College Prizes.

The Prizes offered by the Society to the students of English Training Colleges, for proficiency in geography at the examinations in December last, had been awarded by the examiners in the Education Department as follows:—

Male Students—*Prizes*—(£5 each):—A. J. Catt, Borough Road Training College; R. W. Guppy, Exeter Training College; J. V. Semmens, Westminster Training College; *Book Prizes:*—E. O. Cole, Exeter Training College; F. W. Millson, Borough Road Training College; W. H. Mizen, Borough Road Training College; E. A. Turner, Battersea Training College. Female Students—*Prizes*—(£5 each):—S. A. Crebbin, Whitelands Training College; L. S. Smith, Tottenham Training College; E. M. Williams, Stockwell Training College; *Book Prizes:*—A. Baker, Ripon Training College; E. Hamlyn, Tottenham Training College; A. Nixon, Stockwell Training College; A. Pilling, Stockwell Training College.*

Mr. H. J. Mackinder, in introducing the successful students, made the following remarks:—

It has become customary of late years, that before introducing the students, I should say just a few words on the present state of geographical instruction and the educational work upon which the Society is engaged—so far as it comes within my cognisance. I have to say, with regard to this year, that it has been exceedingly

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* The Medals, for the promotion of geographical education, placed by the Society at the disposal of the syndicates respectively of the Oxford and Cambridge Local Examinations, were awarded as follows:—

1892. Oxford (June).—*Silver Medal*—A. R. Belcher, Maidstone. *Bronze Medal*—D. T. Chadwick, Lincoln.

Cambridge (December).—*Silver Medal* (Physical Geography)—Annie Elizabeth Knight, Eastbourne. *Silver Medal* (Political Geography)—John Graham Bell, Blackheath.

The Prize Atlases offered by the Society for geographical proficiency to the cadets of the Nautical Training Colleges, on board H.M. ships *Worcester* and *Conway*, were awarded, at the examination held in July, 1892, to the following:—H. Y. Berg (*Worcester* training ship); A. C. T. A. Miller (*Conway* training ship).

fruitful, and that so far as Oxford is concerned—of which, of course, alone, I can claim to have an intimate knowledge—I think, as I have said in the report to the Council, there is what we have not been able to speak of, I think before now, a certain definite drift of thought in several subjects studied in the Universities, towards the geographical side of those subjects. It is so, most certainly, on the modern history side, and it is also, and I speak from many little evidences, the same in the literary school; therefore, I think it may be said, that the efforts of the Society are succeeding. As regards the attendance of students, I think I am able to say that it is the largest that we have yet had. We have had during the last winter sixty-one graduates and undergraduates from other colleges, and twenty-six lady students from three halls, in attendance. Though these attendances may not be very great, as contrasted with popular audiences, it is obvious that with a number such as that, a great amount of work can be got through in one subject. I may say that that is the more satisfactory, because we have ventured this winter to put a double amount of work upon each individual student. Then, I am happy further to be able to say what possibly may not be known, even to the Council as yet, that the Oxford travelling studentship, the geographical studentship, part of the funds of which is found by the Society, is likely this year to produce a rather remarkable result. You will remember that the electors appointed a gentleman, Mr. Cozens Hardy, who had already had some experience of the region to which he proposed to go—the frontiers of Montenegro and Albania—of which, curiously enough, less is accurately known than now, I think we may say, of many parts of Africa. The expenditure of the Society has had the effect of bringing considerable additional expenditure from other sources. In all probability, I hear that it is likely that Mr. Hardy will be accompanied or followed by two, three, or four, able students from Oxford. All the members of the expedition are now studying present geography and past geography, and one or two are also studying the archæological side of the district. The district is one of great importance, and there are many points in its ancient geography quite unsettled. I have now to introduce to you the students of the training colleges, connected with our elementary educational system, who have gained the prizes of the Society. There is a little difference this year; you will notice that in the place of a single scholarship of £15 for each division, three prizes of £5 each are awarded to the students first on the list.

The Ballot for the Council, 1893–94.

The President then read the report of the scrutineers on the result of the ballot for the new Council, which declared that the list as proposed by the Council had been elected.

The list is as follows, the names of new members, or those who change office, being printed in *italics*:—

President:—*Clements R. Markham*, Esq., C.B., F.R.S. F.S.A.; *Vice-Presidents*: *Hon. G. C. Brodrick*; Sir Joseph D. Hooker, K.C.S.I., C.B., F.R.S.; Sir John Kirk, K.C.B., G.C.M.G., F.R.S.; *W. T. Blanford*, Esq., LL.D., F.R.S., F.G.S.; General R. Strachey, R.E., C.S.I., F.R.S.; *Captain W. J. L. Wharton*, R.N. F.R.S.; *Treasurer*: Edward L. Somers Cocks, Esq. *Trustees*: Right Hon. Lord Aberdare, G.C.B., F.R.S.; Right Hon. Sir John Lubbock, Bart., F.R.S., M.P.; *Secretaries*: Douglas W. Freshfield, Esq.; H. Seebohm, Esq., F.L.S. *Foreign Secretary*: General Sir C. P. Beauchamp Walker, K.C.B. *Members of Council*: *Admiral Lindesay Brine*; Hon. George N. Curzon, M.P.; Lieut.-Colonel James Cecil Dalton, R.A.; Major Leonard Darwin, R.E., M.P; Francis Galton, Esq., F.R.S.; Sir George D. Taubman Goldie, K.C.M.G.; Major-General

Sir F. J. Goldsmid, K.C.S.I., C.B.; *General Sir T. E. Gordon*, C.B., K.C.S.I.; *Wilfred Hudleston*, Esq., F.R.S., F.G.S.; *General Sir W. Drummond Jervois*, G.C.M.G., C.B.; *J. K. Laughton*, Esq.; *George Sutherland Mackenzie*, Esq.; E. Delmar Morgan, Esq.; John Murray, Esq.; Ernest G. Ravenstein, Esq.; Sir Rawson W. Rawson, K.C.M.G., C.B.; *Howard Saunders*, Esq., F.L.S., F.Z.S.; Colonel H. C. B. Tanner; General J. T. Walker, R.E., C.B., F.R.S.; *Colonel C. M. Watson*, R.E., C.M.G.; Colonel Sir Charles W. Wilson, R.E., K.C.B., K.C.M.G., F.R.S.

The Earl of Mayo rose and stated that he had a resolution to propose. The President said he could do so after the Annual Address had been read.

A Fellow asked if it were not necessary to give seven days' notice of any resolution to be proposed.

The President stated that that was so in the case of a Special General Meeting, but that such notice was not necessary at the Anniversary Meeting.

The President then proceeded to read his Annual Address, after which the Earl of Northbrook said:—As a past-president of the Royal Geographical Society, I am as well aware as any one that however interesting the work of the Society may be, the work devolving upon the President is most arduous and laborious. There are no scientific societies which involve greater attention to their business, on the part of the President, than does the work of the Royal Geographical Society, and I rise with great pleasure to move that the thanks of this meeting be given to the Right Hon. Sir Mountstuart Grant Duff, not only for the most interesting address which he has read to-day, but for the very valuable services which he has rendered to the Society as its President during the past four years. During these four years probably more interesting meetings of the Society have been held than at any previous time—at least there have been none more interesting. We have had most distinguished explorers from Africa, who have attracted a great part of public attention during that time. We have had Mr. Stanley, Captain Lugard, and now Mr. Selous, to whom the Society has to-day awarded the Founders' Medal. But in other parts of the Earth the progress of geographical discovery has been remarkable. We have had Captain Bower, Mr. Rockhill, Dr. Nansen, and Mr. Conway; and these distinguished travellers have given the opportunity to our President to deliver these interesting addresses, for which he is so peculiarly distinguished. Therefore, upon no occasion in my recollection should a vote of thanks be more heartily responded to than to that which I am about to move to our President. I do not wish to occupy your time at any length, as this is a long meeting, but I must say that it has been to me a great personal pleasure to have been accidentally present here to-day, and to have had the honour conferred upon me of being asked to move this vote of thanks, because I have enjoyed the friendship of your President for many years, and I have had many opportunities of appreciating his extraordinary knowledge confined not to a few parts of the world, and his many qualities, which have made him an admirable President of the Royal Geographical Society. I beg to move that the cordial thanks of this meeting be given to the Right Hon. Sir Mountstuart Grant Duff for the address he has read to-day, and for his eminent services during four years as President of the Royal Geographical Society.

Sir John Lubbock, in seconding, said: The President in his address just now alluded to the progress and prosperity of the Royal Geographical Society. That, no doubt, is due to a variety of causes; but I think you will all agree with me that one of them, and that not the least, has been the great ability and energy which our President has shown in the chair. Under the circumstances, and particularly at this late hour of the afternoon, I think it would be a work of supererogation to enlarge upon the subject, in seconding this resolution, and as Lord Northbrook has so very ably and fully proposed it to you, and alluded to the

many reasons why we should vote for it, I will content myself with thus briefly seconding the resolution.

The resolution having been heartily carried,

The PRESIDENT said: I beg to return my most heartfelt thanks to all the members of this Society for the resolution which they have passed, and to Lord Northbrook and Sir John Lubbock for the extremely kind terms in which they have respectively proposed and seconded it. It will always be a matter of gratification to me that the four years in which I have held the office of your President have synchronised with a period of remarkable prosperity in the history of the Society. I trust that this period of increased prosperity is only commencing, and that although we have had of late some rather lively passages, that they will all very soon come to an end, and that the question now before us will be settled in the only possible way in which it can be settled when it has once been fairly opened.

The Earl of MAYO then moved "That the Council be requested to elect more ladies as Fellows."

This was seconded by Sir FREDERICK YOUNG.

Mr. WILLIAM HICKS moved the previous question.

Lord Mayo's motion was supported by Lord Northbrook, Sir John Lubbock, Sir William H. Flower, General Strachey, and others, who, however, urged Lord Mayo not to press his motion. Lord Mayo in the end withdrew his motion; on the understanding that on the requisition of himself and five other Fellows, it should be submitted to a Special General Meeting to be summoned as soon as practicable.

The meeting then adjourned.

Thirteenth Ordinary Meeting, June 5th, 1893.—General R. STRACHEY, R.E., C.S.I., F.R.S., Vice-President, in the Chair.

ELECTIONS.—*Colonel Patrick Wilson Bannerman (India Staff Corps); Charles Raymond Beazley, M.A.; Frederick Gudgin; Surgeon-Captain James Sullivan Green (Army Medical Staff); James George Langham; T. Fawset Macdonald, M.D.; Edward Harker V. Melvill; Thomas Owen; Captain H. Picot, I.S.C.*

The Paper read was:—

"Stairs' Expedition to Katanga." By Dr. J. A. Moloney.

There was an exhibition of photographs and maps in the tea-room.

THE ANNIVERSARY DINNER.

The anniversary dinner of the Society was held on Saturday, May 13th, in the Whitehall Rooms, Hôtel Métropole, the Right Hon. Sir Mountstuart E. Grant Duff, President, in the chair. Among those present were the Swedish Minister, the Danish Minister, Lord Kelvin, Right Hon. James Bryce, M.P., the Comte de Franqueville, the Lord Mayor, Sir John Dorington, General Sir F. Grenfell, Sir F. Bramwell, Sir Charles Tupper, Sir R. Welby, Sir R. Herbert, Sir George F. Bowen, General Sir R. Meade, Sir Thomas Wade, Sir A. Geikie, Sir A. Moloney, Sir Arthur Hodgson, General R. Strachey, General J. T. Walker, Colonel J. C. Dalton, Mr. John Murray, Mr. H. M. Stanley, Mr. F. C. Selous, Captain Lugard, Mr. T. S. Osler, Mr. C. H. Pearson, Mr. W. T. Thiselton Dyer, Mr. J. G. Fitch, Dr. H. Craik, Mr. Douglas W. Freshfield, and Mr. H. Seebohm.

After the usual loyal toasts, the PRESIDENT proposed "The Army, Navy, and

the Reserve Forces, and the Diplomatic and Consular Services," to which General Sir F. Grenfell and Mr. James Bryce, M.P., responded.

General Sir F. GRENFELL said he had always regretted that, in the various expeditions in which he had served, no members of any scientific society had been attached to the Army. In Egypt our Intelligence Department has endeavoured to obtain, as far as possible, accurate maps of the country, and when they were all put together they would form a most invaluable record of our occupation. He specially referred to Colonel Ardagh, R.E., who carried on the survey in Lower Egypt, and to Mr. Floyer, who had made an expedition into the Atbai and had written a most valuable report on the country between the Nile and the Red Sea.

Mr. BRYCE said it was a happy and suitable thought to couple the Diplomatic and Consular service, as being equally non-political and equally an object of common pride to us with the other two services. His own connexion with these services lasted only six months, but it had been more than long enough to enable him to discover how large a quantity of energy, high ability, and public spirit we possessed in the men who represented Great Britain abroad. The old idea of a diplomatist was that he spent his time in the ball-rooms of Continental Governments, the elder men in playing whist and the younger men in dancing. But now the work of diplomatists and of consuls was anything but easy, although at the same time the old notion still lingered in some quarters, for he had heard it expressed in a place which was not only the prolific workshop of legislative novelties, but also the refuge of obsolete superstitions—he meant the House of Commons. Our representatives abroad were now really hard-worked men, and they had to present elaborate and enormous reports on all sorts of subjects, including the manners which occasionally made English tourists unpopular abroad. These reports were of very great permanent value, and he believed their value would be more fully recognised if they were not published by the Government, for as soon as they were issued from the Queen's printers they were considered proper matter to be sold as waste-paper. He knew of no means so authentic and trustworthy of obtaining information as to the commercial and industrial progress of civilised and semi-civilised countries as these reports afforded. The benefits which these representatives of Great Britain had been able to render to the British explorers in the work of the Royal Geographical Society was nothing more than a due repayment of the debt which this country and the Government of this country owed to the Society for the voluntary work it had done in so many spheres and with such untiring and persistent energy on behalf of British political and commercial interests. Its work was increasing year by year in importance, and in any other country would be undertaken by a Government department.

In proposing the toast of "The Medallists," the PRESIDENT said: This dinner has usually taken place on the evening of the anniversary meeting; but, it having been found impossible to obtain this room for the 29th, we hold it now. One result of that is that the medals have not yet been conferred, and so I am obliged to speak of "The Medallists-Designate." You will all agree, I am sure, that the choice of the Council for the highest honours which it is in our power to bestow has fallen upon very worthy recipients. The first of these is Mr. Selous, whom we have the pleasure of welcoming this evening. Educated at Rugby under the present Bishop of London, Mr. Selous went to Africa whilst still a mere boy—so boyish, indeed, in appearance that a native chief burst out laughing when informed that he desired to shoot elephants. He remained, however, in the country, and attained there the kind of reputation which attached in old days to the slayer of the Nemean lion, and all others who helped to establish the supremacy of the featherless biped over the quadruped. Gradually, in the course of twenty years, he acquired an unique

knowledge of a vast region about which we had, before he took it in hand, only slight and scattered notices. At all times he has placed his great stores of information freely at the disposal of our Society; and recently he has done a great service to the Empire by running a road through territories which, only a very few years ago, were thought unlikely to be brought within the range of civilisation in the days of any man living. That is a splendid achievement, making it certain that his name will live in history, and entitling us to say that, in honouring him, we honour as well this Society as the company of distinguished men and women who have received our medals.

The second medallist-designate is Mr. Woodville Rockhill, an American diplomatist, who has made himself famous by his explorations in Western China and North-Eastern Tibet. The first of these was made in 1889, and carried him to a point only twelve days' march from Lhasa. His second journey was in 1892, when he tried to cross Tibet into British territory, and was only prevented doing so by the failure of supplies. Everywhere he has surveyed, everywhere he has studied the ethnology as well as the languages of the lands he has visited, and has gained a name, not only as an explorer but as an Orientalist. Many of you will remember that he came hither lately and read to us a very interesting paper; but he was obliged to return immediately to America, and that is the reason why we do not see him here to-night. I must accordingly lay upon our distinguished countryman Mr. Selous the duty of replying for both our medallists-designate, and I do so with the certainty that he will fulfil that, like all other duties which have ever been laid upon him, to admiration.

Mr. SELOUS responded for the medallists.

The toast of "Prosperity to the British Empire" was proposed by Sir ROBERT HERBERT, and responded to by General Sir RICHARD MEADE and Sir CHARLES TUPPER.

The PRESIDENT proposed "Literature, Science, and Art, in the Colonies," and the toast was responded to by Mr. C. H. PEARSON.

Mr. H. SEEBOHM proposed the "Allied Sciences," to which Lord KELVIN, President of the Royal Society, replied.

The toast of the "Sister Geographical Societies" was proposed by Mr. DOUGLAS W. FRESHFIELD, and responded to by the Rev. S. A. STEINTHAL (Manchester).

Sir GEORGE BOWEN proposed the "Guests," for whom the SWEDISH MINISTER replied.

The concluding toast was "The Royal Geographical Society," which was proposed by Mr. W. T. THISELTON DYER. The PRESIDENT replied as follows:—

At this late hour my words must be few, but there are one or two things which I should like to say in replying to the toast which Mr. Dyer has proposed in such friendly terms. In leaving the chair of the Royal Geographical Society I look back with pleasure upon the almost unclouded prosperity which it has enjoyed for the four years during which I have had the honour of presiding over its destinies. Each one of these years would have seen a nett increase to our numbers if the terrible epidemic of 1891–2 had not so grievously swelled our Obituary. This year, however, we have sprung forward again, and our nett increase has been no less than one hundred and sixty-six. We have now three hundred and fifty-eight more members than we had four years ago, in all close upon three thousand seven hundred. Since the commencement of 1893 new members pay £5, not £3, as entrance money, but that fact does not seem in the slightest degree to have deterred candidates from coming forward. Our papers during the present Session have been unusually numerous, and their scientific quality has been much above the average. If latterly there have arisen some differences of opinion between the

Council and a section of the Fellows I hope that my readiness to spring into the gulf for the sake of the Republic and of woman may have a good effect. I should like to take the opportunity of the presence of two very distinguished members of the Senate of the University of London to express to them by word of mouth what we have again and again expressed in writing, that is, the gratitude of the Society for the use of its theatre. Ere long we shall have to take up most seriously the question of raising a new and very large building to meet our increasing wants, but, meantime, I trust that if we continue to have the use of the theatre the character of our papers will do as they have done of late years even more and more honour to the locality in which they are delivered. I shall have a further opportunity of thanking many people who have assisted or co-operated with me; but the presence of Mr. Osler and Mr. Fitch with us to-night makes this the most fitting occasion to thank them and their colleagues.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By HUGH ROBERT MILL, D.Sc., *Librarian*, R.G.S.

[The following abbreviations of nouns and the adjectives derived from them are employed to indicate the source of articles from other publications. Geographical names are in each case written in full:—

A. = Academy, Academie, Akademie.
Ann. = Annals, Annales, Annalen.
B. = Bulletin, Bollettino, Boletim.
Com. = Commerce, Commercial.
C. R. = Comptes Rendus.
Erdk. = Erdkunde.
G. = Geography, Geographie, Geografia.
Ges. = Gesellschaft.
I. = Institute, Institution.
J. = Journal.
M. = Mitteilungen.
Mag. = Magazine.
P. = Proceedings.
R. = Royal.
Rev. = Review, Revue, Revista.
S. = Society, Société, Selskab.
Sitzb. = Sitzungsbericht.
T. = Transactions.
V. = Verein.
Verh. = Verhandlungen.
W. = Wissenschaft, and compounds.
Z. = Zeitschrift.]

On account of the ambiguity of the words *octavo*, *quarto*, &c., the size of books in the list below is denoted by the length and breadth of the cover in inches to the nearest half inch. The size of the *Journal* is 10 × 6½.

EUROPE.

England—Lake District. **Haviland.**

The Geographical Distribution of Disease in Great Britain. By Alfred Haviland. Second edition. London, Swan Sonnenschein & Co., 1892: size 10 × 6½, pp. xvi. and 406. *Maps. Price* 16*s.*

The geographical conditions of the Lake District are considered in all their aspects with relation to disease, other parts of the country are only generally treated. The result is an interesting example of applied geography, touching on the true function of geographical science—the elucidation of the influence exercised by the natural conditions of the Earth's surface upon the human race. It is designed as the first part of an extensive work, taking up the whole of Great Britain in its large natural divisions, and explaining for each, by reference to conditions of soil and climate, the remarkable differences in the distribution of various diseases which have been proved to exist.

England—London. **Buchan.**

The Temperature of London for 130 years, from 1763 to 1892. By Dr. Buchan. *From the 'Journal' of the Scottish Geographical Society* for 1892: size 11 × 7, pp. 11. *Presented by the Author.*

The mean annual air temperature of London is deduced as 50°·2 F., the mean

January temperature 37°·6, the mean July temperature 63°·7. For the last 35 years the annual mean has been 50°, the first four months of the year being about half a degree warmer, and the last four months of the year fully three-quarters of a degree colder than the long-period mean.

England and Wales. **Bevan.**

Home Geography of England and Wales for the use of schools. By [the late] G. Phillips Bevan. With twelve coloured double-page maps. London, Swan Sonnenschein & Co., 1893: size 8 × 5, pp. 248. *Price* 4*s.* 6*d.*

This work to be useful must be supplemented by careful teaching. It follows the unfortunate plan of taking the county as a unit, and gives no generalised description, consequently no idea of the structure or physical geography of the country is conveyed. River and railway systems treated in detached portions as they happen to bound or traverse each county become very confusing.

Europe—Geodetical. **Helmert.**

Die Europäische Längengradmessung in 52 Grad breite von Greenwich bis Warschau. I Heft Hauptdreiecke und Grundlinienanschlüsse von England bis Polen. Herausgegeben von F. R. Helmert. Mit zwei lithographirten Tafeln. Berlin, Stankiewicz (Veröffentlichung des königl. preussischen geodätischen Institutes und Centralbureaus der internationalen Erdmessung) 1893: size 12 × 9 pp. 264. *Presented by the Royal Prussian Geodetic Institute.*

Hungary—Tatra. **Grissinger.**

Studien zur physischen Geographie der Tatra-Gruppe. Von Dr. Karl Grissinger. Seperat-Abdruck aus dem xviii; Jahresberichte des Vereines der Geographen an der Universität Wien. Wien, 1893: size 9½ × 6, pp. 82. *Presented by the Author.*

Italy and Russia. **Pierling.**

L'Italie et la Russie au xvi^e^ siècle. Voyages de Paoletto Centurione à Moscow.—Dmitri Guérasimov à Rome.—Gian Francesco Citus à Moscow. Par P. Pierling. Paris, Leroux, 1892: size 7 × 4½ *in.*, pp. vi., 134. *Presented by the Author.*

Centurione found his way to Moscow in 1519 in order to negotiate for a trade route between India and Europe, passing down the Oxus and up the Volga. The result of his journey and subsequent negotiations between Moscow and Rome are recorded in the book.

Poland. **Morfill.**

Poland. By W. R. Morfill, M.A. London, Fisher Unwin, 1893: size 8½ × 5½ *in.*, pp. xvi. and 390. *Map. Price* 5*s. Presented by the Publisher.*

The latest volume of the "Story of the Nations" series gives the history of Poland, compiled anew from original sources, and told in an impartial spirit.

Russia. **Whishaw.**

Out of Doors in Tsarland; a record of the seeings and doings of a wanderer in Russia. By Fred J. Whishaw. London, Longmans, Green & Co., 1893: size 8 × 5½ *in.*, pp. viii. and 380. *Price* 7*s.* 6*d. Presented by the Publishers.*

Bright sketches of scenes in Russia, written in a light and bantering style.

Russia—Anthropology. **Zograf.**

Les types anthropologiques des Grands Russes des gouvernements du centre de la Russie. Par N. Zograf, Moscow.

This French abstract accompanies a great volume in Russian descriptive of the types of inhabitants in Great Russia, and illustrated by numerous portraits and statistical diagrams. The memoir is presented by the author.

Scotland—Edinburgh. *Scottish G. Mag.* 9 (1893): 302–312. **Cadell.**

Some ancient landmarks of Midlothian (*with map*). By Henry M. Cadell, of Grange, B.Sc.

An interesting reconstruction of the scenery of the site of Edinburgh in prehistoric times before the elevation of the 25-foot raised beach or the draining of the numerous lakes and marshes which formerly existed.

Switzerland—Census.

Les Resultats du Recensement Fédéral du 1er Décembre, 1888. Deuxième Volume. La population répartie d'après le sexe, l'état civil et l'âge. Berne, 1893: size 11½ × 9, pp. 51* and 216. *Plates* 4.

Switzerland—Neuchatel. **Graf.**

Notice sur la plus ancienne carte connue du Pays de Neuchâtel, par le Dr. J. H. Graf. Neuchatel, 1892: size 9½ × 6, pp. 30. *Presented by the Author.*

ASIA.

India. **Younghusband.**

The Invasion of India by Russia. By Captain [G. J.] Younghusband. Size 10 × 6½, pp. 22. *Map. From the 'Nineteenth Century' for May*, 1893.

India—Burma. **Cunningham.**

Mahabodhi or the great Buddhist Temple under the Bodhi-tree at Buddha-Gaya. By Major-General Sir A. Cunningham, R.E., K.C.I.E. London, W. H. Allen & Co., 1892: size 13 × 10, pp., text, 88, *plates*, xxxi. *Presented by the Secretary of State for India.*

Full description of the present state of this remarkable temple and historical notes regarding the various alterations it has undergone.

India—Census.

Census of India, 1891. Vols. I. and II., Assam. By E. A. Gait (Shillong). Vol. VI., Berar. By Warren Hastings (Calcutta). Vols. VII. and VIII., Bombay. By W. W. Drew (Bombay). Vols. IX. and X., Burma. By H. L. Eales (Rangoon). Vols. XIX., XX., XXI., The Punjab and its Feudatories. By E. D. Maclagan (Calcutta). Size 13½ × 8½. *Maps and diagrams*, 1892. *Presented by the Secretary of State for India.*

Japan. **Bickersteth.**

Japan as we saw it. By M. Bickersteth. With a Preface by the Bishop of Exeter. London, Sampson Low & Co., 1893: size 9 × 6, pp. xvi. and 354, *map and illustrations*. *Price* 21*s.*

This volume describes Japan mainly from the standpoint of the Anglican missionary. Miss Bickersteth saw a good deal of the country during her eight weeks' sojourn. She visited, among other places, Tokyo, Nikko, Ikao, and Kyoto. The volume, however, is chiefly interesting for the vivid description it gives of the great earthquake which occurred at Osaka in October 1891. The author further describes her visit to Nara, the ancient capital of Japan; her voyage across the Inland Sea; and visit to Kiushiu.

Kashmir. **Knight.**

Where Three Empires Meet. A narrative of recent travel in Kashmir, Western Tibet, Gilgit, and the adjoining countries. By E. F. Knight. With a map and 54 illustrations. London, Longmans, Green & Co., 1893: size 9½ × 6, pp. xvi. and 496. *Price* 18*s.* *Presented by the Publishers.*

Mr. Knight visited Kashmir as a literary tourist, joined the Hunza-Nagar Expedition as a volunteer and saw some active service in the gorges of the Karakoram. He describes his experiences and observations with effect, and has written a most readable book. The present state of Kashmir is admirably sketched, and the character of the many native peoples met with in those remote regions is cleverly described. The map, only a sketch, is sufficient for its purpose, and the illustrations are all of great interest.

Mongolia. **Gilmour.**

More about the Mongols. By James Gilmour. Selected and arranged from the diaries and papers of James Gilmour, by Richard Lovett, M.A. London, Religious Tract Society, 1893: size 8 × 5¼, pp. 320. *Presented by the Religious Tract Society.*

Contains a graphic account of a journey across the Gobi from Pekin to Kiakhta twenty years ago.

Persia. **Biddulph.**

Four Months in Persia and a Visit to the Trans-Caspian. By C. E. Biddulph, M.A. London, Kegan Paul & Co., 1892: size 10½ × 7, pp. 138. *Price* 3*s.* 6*d.* *Presented by the Publishers.*

Mr. Biddulph's journey in Persia in 1891, about which he communicated a paper to the Society (*Proceedings* 13 (1891): 645), is here described at greater length, but without a map. There is added to it an account of a visit to Trans-Caspia in 1890.

AFRICA.

Algeria and Tunis. **Boutroue.**

L'Algérie et la Tunisie a travers les Ages. Par Alexandre Boutroue. Paris, Leroux, 1893: size 10½ × 6½, pp. 62. *Maps.* *Presented by the Author.*

Historical notices on Northern Africa which formed the subject of two papers to the Paris Geographical Society.

Algeria—Kabylia. **Liorel.**

Races Berbères. Kabylie du Jurjura. Par Jules Liorel. Preface de M. Emile Masqueray. Paris, Leroux. *Not dated* (1893): size 7½ × 5, pp. xviii. and 544. *Presented by the Publisher.*

A comprehensive study of the Algerian Kabyles systematically arranged. The work loses a good deal of its value through the absence of illustrations or maps.

Eastern Sudan. **Hassan.**

Die Wahrheit über Emin Pascha, die ägyptische Aequatorialprovinz und den Soudan. Von Vita Hassan unter der Mitarbeit von Elie M. Baruck. Aus dem französischen Original übersetzt und mit Anmerkungen versehen von Dr. B. Moritz. Berlin, 1893, Dietrich Reimer: size 9½ × 6½, pp. xvi. and 224. *Portrait of Vita Hassan.* *Price* 3 *m.* 50. *Presented by the Publisher.*

Description by Emin's apothecary, the late Vita Hassan, of the fall of the Equatorial Province.

Somali-land. **Swayne.**

Report on the Reconnaissance of Northern Somali-land, February to November, 1891. By Captain H. G. C. Swayne, R.E., and Lieutenant E. J. E. Swayne, 16th Bengal Infantry. Bombay, 1892: size 13½ × 8½, pp. 116. *Incomplete.* *Presented by the Secretary of State for India.*

The copy of this Report sent for use in the Library is mutilated by the excision of several pages and numerous passages, which for political reasons the Government of India think it right to keep confidential. The map is also withheld. In spite of the suppression of this information, the Report contains much that is of great interest geographically.

Southern Africa. **Bryden.**

Gun and Camera in Southern Africa. A year of wanderings in Bechuanaland, the Kalahari Desert, and the Lake River Country, Ngamiland, with Notes on Colonisation, Natives, Natural History, and Sport. By H. Anderson Bryden. London, E. Stanford, 1893: size 9 × 6, pp. xiv. and 544. *Maps and illustrations.* *Price* 15*s.* *Presented by the Publisher.*

A well illustrated account of life and conditions in some of the recently opened up regions of South Africa.

NORTH AMERICA.

American Birds. **Keeler.**

Evolution of the Colours of North American Land Birds. By Charles A. Keeler. (Occasional Papers of the California Academy of Sciences, III.). San Francisco, 1893: size 10 × 6½, pp. xii. and 362. *Coloured Plates.* *Price* $5. *Presented by the California Academy of Sciences.*

Lake Superior—Raised Beaches. **Lawson.**

Sketch of the Coastal Topography of the North Side of Lake Superior, with special reference to the abandoned strands of Lake Warren (the

greatest of the late Quaternary Lakes of North America). By Andrew C. Lawson, University of California. Pp. 181–289 of the Twentieth Annual Report for the year 1891 of the Geological and Natural History Survey of Minnesota. Minneapolis, 1893. *Presented by N. H. Winchell, Esq., State Geologist.*

The memoir is illustrated by a sketch-map of the north shore of Lake Superior and several photographs of the terraces, the structure of which is examined.

Manitoba. **Legge.**

Sunny Manitoba; its Peoples and its Industries. By Alfred O. Legge. London, T. Fisher Unwin, 1893: size 8½ × 6, pp. 297. *Map and plates. Price 7s. 6d. Presented by the Publisher.*

The author's aim in the present volume is to impart to the reader an impartial and accurate account of the province of Manitoba, mainly as to its suitability for emigration purposes.

United States—Gravity Determinations. **Mendenhall.**

Determination of Gravity with half-second pendulums on the Pacific Coast, in Alaska, and at Washington, D.C., and Hoboken, N.J. By T. C. Mendenhall. Being Appendix No. 15 to Report of the U.S. Coast and Geodetic Survey for 1891. Washington, Government Printing Office, 1892: Size 7 × 6, pp. 62. *Presented by the Author.*

Description of methods and results of observations made in 1891; illustrated by figures of the apparatus employed.

United States—Maps. *Science* **21** (1893): 225–227. **Davis.**

The Topographic Maps of the United States Geological Survey. By W. M. Davis, Harvard College.

United States—Pacific Slope. **Wiley.**

The Yosemite, Alaska, and the Yellowstone. By William H. Wiley and Sara King Wiley. *Reprinted from 'Engineering.'* London, *Engineering* Office. *Not dated* (1893): size 11¼ × 9, pp. 230. *Price 16s.*

A practically worded record of a trip through California, Alaska and the Yellowstone Park, profusely illustrated. One of the best works of its kind.

CENTRAL AND SOUTH AMERICA.

Argentine Republic. **Akers.**

Argentine, Patagonian and Chilian Sketches, with a few Notes on Uruguay. By C. E. Akers. London, Harrison & Sons, 1893: size 8 × 5¼, pp. 190. *Price 5s. Presented by the Publishers.*

Mr. Akers spent two years in South America as special correspondent of the *Standard*, and naturally has a good deal to say of the commercial and political situation of the republics he visited. The main value of his book lies in the account of long journeys through the still little-known parts of Patagonia which are gradually being invaded by salt-merchants and cattle-ranchers.

Colombia. **Nuñez and Jalhay.**

La Republique de Colombie. Geographie, Histoire, Organisation Politique, Agriculture, Commerce, Industrie, Statistique, Tarif douanier, Indicateur, commerciel, etc. Par Ricardo Nuñez et Henry Jalhay. Bruxelles: Stevelinck 1893: size 10 × 6½, pp. 262. *Map. Presented by the Authors.*

The Consul-general and Consul of Colombia in Belgium have written this book in order to make known the character and resources of their little-known country. The data are, as far as possible, official, but figures are given under reserve as "Statistical science is still in its infancy in Colombia." The work bears every mark of conscientious compilation.

Patagonia. **Dixie.**

Memories of a Great Lone Land. By Lady Florence Dixie. Size 10½ × 6½, pp. 9. *From the 'Westminster Review,' March*, 1893.

Reminiscences of Patagonia.

POLAR REGIONS.

Greenland. *P. A. Nat. Sci. Philadelphia* (1892): 342-349. **Peary.**

Report of the Operations of the North Greenland Expedition of 1891–1892.

AUSTRALASIA AND PACIFIC ISLANDS.

Australians. **Adams.**

The Australians: A Social Sketch. By Francis Adams. London, T. Fisher Unwin, 1893: size 8½ × 6, pp. 314. *Price* 10*s.* 6*d.* *Presented by the Publisher.*

Consists of a series of essays mainly dealing with Australian social life, most of which have already appeared in the *Fortnightly Review*.

Chatham Islands. **Forbes.**

The Chatham Islands and their Story. By Henry O. Forbes: size 10½ × 6½, pp. [22]. *From the 'Fortnightly Review' for May* 1893.

Queensland. ——

Letters from Queensland. By *The Times* Special Correspondent. London, Macmillan & Co., 1893. Size 7¼ × 5, pp. 110. *Price* 2*s* 6*d.* *Presented by the Publisher.*

This is a reprint of the admirable series of letters from Queensland, published in the *Times* in December 1892, and January and February 1893.

South Australia. **Hodder.**

The History of South Australia from its foundation to the year of its Jubilee, with a chronological summary of all the principal events of interest up to date. By Edwin Hodder. With two maps. London, Sampson Low, Marston & Co., 1893: 2 vols., size 8½ × 5½, vol. 1, pp. 392, vol. 2, pp. viii., and 400. *Price* 24*s.*

The only map accompanying this valuable history represents the state of the land as regards ownership or occupation. The other "map" is a diagram. The earlier chapters dealing with exploration and the first settlement of "the province of South Australia," are full of geographical interest.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

Geodesy. ——

Tableau des Longuers du Pendule aux différentes stations de l'Empire Russe et de l'étranger, observées par des Savants Russes. St. Petersburg, 1893: size 9½ × 6½. pp. [2] *and table.* *Presented by the Russian Geographical Society.*

Geological Climate. **Seward.**

Fossil Plants as Tests of Climate, being the Sedgwick Prize Essay for the year 1892. By A. C. Seward, M.A., F.G.S. London, C. J. Clay & Sons, 1892: 8vo, pp. 152. *Price* 5*s.* *Presented by the Author.*

A vindication of the value of fossil plants as indicative of the climate in past ages. Two chapters are devoted to the geographical distribution of existing plants and the effect of low temperature on vegetation. The whole essay shows wide reading, and the collection of references makes a useful bibliography.

Oceans. *Globus* **63** (1893): 317-319. **Swarowsky.**

Entstehung und Dauer der Weltmeere. Von Dr. A. Swarowsky. Wien.

A contribution to the controversy on the permanency of oceans and continents.

Physical Geography. **Klein.**

Jahrbuch der Astronomie und Geophysik. Enthaltend die wichtigsten Fortschritte auf den Gebieten der Astrophysik Meteorologie, und physikalischen Erdkunde. III. Jahrgang 1892: Von Dr. Hermann J. Klein. Leipzig, E. H. Mayer, 1893: size 9 × 6, pp. x. and 350. *Price* 2*m.*

An excellent epitome of the most important researches in physical geography published in 1892.

Tides. **Whall.**

Handy Book of the Tides, with fifteen charts, showing the state of the tide at every hour at Dover. Compiled from various sources by W. B. Whall. Fourth edition. London, G. Philip & Son. *Not dated* (1892?): size 11½ × 9, pp. 10, *and charts*. *Price* 3*s*. 6*d*.

The charts show by arrows the set of the tides in the North Sea and round the British Islands every hour.

GENERAL.

Colonisation. **Greswell.**

Outlines of British Colonisation. By the Rev. William Parr Greswell. With an Introduction by the Right Hon. Lord Brassey, K.C.B. London, Percival & Co., 1893: size 8 × 5¼, pp. xvi. and 358. *Price* 6*s*.

A concise and well-written epitome of British colonisation historically considered. More than a quarter of the book is composed of statistical appendices, and there are numerous references to the literature regarding the various colonies.

Columbus. **Porto-Alegre.**

Colombo. Poema por Manoel de Araujo Porto-Alegre. Rio de Janeiro, 1892: size 9½ × 7, pp. xxiv. and 736. *Presented by the Historical and Geographical Institute of Brazil.*

Columbus. **Silva.**

Christovam Columbo e o descobrimento da America pelo conselheiro J. M. Pereira da Silva. Rio de Janeiro, 1892: size 9½ × 7, pp. xii. and 180. *Presented by the Author.*

Cook's Journal. **Wharton.**

Captain Cook's Journal during his First Voyage round the World made in H.M. Bark *Endeavour*, 1768–71. A literal transcription of the original MS. With Notes and Introduction. Edited by Captain W. J. L. Wharton, R.N., F.R.S., Hydrographer of the Admiralty. Illustrated by maps and facsimiles. London, Elliot Stock, 1893: size 11 × 8, pp. lvi. and 400. *Price* 21*s*. *Presented by the Publisher.*

A special notice of this book will be given.

Educational. **Hughes and Williams.**

An Introduction to the Study of Geography, Mathematical, Physical, Political, and Commercial. By William Hughes and J. Francon Williams. London, G. Philip & Son, 1893: size 7½ × 5½, pp. viii. and 100. *Plate*. *Price* 1*s*. *Presented by the Publishers.*

Educational. **Lyde.**

The Glasgow Series of Elementary Geography. By Lionel W. Lyde, M.A. London, Percival & Co.: size 6½ × 4½. *Maps*. New Zealand and Tasmania, 1892: pp. 92. British North America, 1892: pp. 88. British South Africa, 1893: pp. 84. Australia, 1893: pp. 168. *Price, each volume*, 1*s*. *net*.

The volumes of this little series dealing with the British Colonies gain greatly from an educational point of view in being all the work of one practical and skilled teacher.

Educational—Textbooks. **Redway**

Textbooks of Geography. By Jacques W. Redway. Size 10 × 6½, pp. [10]. *From the 'Educational Review' (New York) for February*, 1893.

Criticism of the modern American geographical textbooks.

Italy—Official. ——

Bollettino Consolare pubblicato per cura del Ministero per gli Affari Esteri d'Italia. Vols. I.—XXIII. Torino, Firenze, Roma, 1861–1887: size 10 × 6½. *Plates, &c*. *Presented by the Italian Government.*

Italy—Official. ——

Bollettino del Ministero degli Affari Esteri. [10 vols.] 1888–1892. Roma, 1888–1893: size 10½ × 6½. *Maps, &c*. *Presented by the Italian Government.*

NEW MAPS.

By J. COLES, *Map Curator*, R.G.S.

EUROPE.

British Isles. **Habenicht.**

Sydow-Habenicht: Methodischer Wand-Atlas, Nr. 14: Britische Inseln. Orohydrographische Schul-Wandkarte nach E. v. Sydows Plan, bearbeitet von H. Habenicht. Scale 1: 750,000, or 10·3 geographical miles to an inch. Gotha, Justus Perthes, 1893. 9 sheets. *Price* 10 *marks.*

England and Wales. **Ordnance Survey.**

Publications issued since May 12th, 1893.

1-inch.

ENGLAND AND WALES: 341, 342, Hills photozincographed in brown, 1*s.* each. **Scotland,** 118 Hills 1*s.*

6-inch—County Maps:—

ENGLAND AND WALES: **Yorkshire,** 174 S.W., 176 S.E., 249 S.W., 284 S.W., 1*s.* each.

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ENGLAND AND WALES: **Lancashire,** LI. 12, 5*s.*; 15, 16, LII. 3, 4*s.* each; 4, 5, 6, 7, 8, 5*s.* each; 10, 4*s.*; 13, 5*s.*; 14, LIX. 3, 7, 11, 4*s.* each; 15, 5*s.*; LXVII. 1, 4, LXVIII. 1, 2, 5, 9, 4*s.* each; 10, 5*s.*; LXXI. 1, 4*s.*; LXXIX. 4, 8, 5*s.* each; 9, 4*s.*; 14, 5*s.*; 15, 4*s.*; XCV. 3, 8*s.*; XCVIII. 4, 4*s.*; XCIX. 3, 5*s.*; 4, 7, 4*s.* each; CIII. 2, 4*s.*; CIV. 10, 20*s.* 6*d.*; CVI. 3, 4, 5, 5*s.* each (coloured). **Yorkshire,** XI., 13, 3*s.*; 14, 4*s.*; XXII. 3, 3*s.*; XXXVII. 1, 10, 4*s.* each; XLII. 11, 15, 3*s.* each; LXVII. 12, 4*s.*; 15, 3*s.*; LXXIII. 2, 3*s.*; 9, 4*s.*; 10, 14, 3*s.*; CXI. 9, 3*s.*; CXL., 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, CXLI. 9, CLVII., 1, 2, 5, 4*s.* each; 6, 5*s.*; CLXXXVI. 10, 3*s.*; 14, 15, 4*s.* each; CCIV. 1, 5*s.*; 2, 9, CCXVII. 10, 4*s.* each; 11, 12, 5*s.* each; CCLXIV. 7, 4*s.*; 8, 5*s.*; 12, 16, CCLXV. 6. 4*s.* each; 8, 5*s.*; 9, 10, 13, 14, 15, 16, CCLXXII. 14, 15, 4*s.* each; CCLXXIV. 7, 11*s.* 6*d.*; 11, 8*s.*; CCXCIV. 1, 4*s.*; 2, 14, 5*s.* each; CCXCVII. 2, 9, 4*s.* each (coloured).

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ASIA.

Indian Government Surveys. **Surveyor-General of India.**

Indian Atlas, 4 miles to an inch. Quarter Sheets:—39 N.E. Parts of Districts Ahmednagar (Bombay Presidency), Bid, and Naldurg (Nizam's Dominions). 43, N.E. Parts of Districts Shimoga, Kadur and Hassan (Mysore). 60, S.W., Parts of Districts Mysore, Hassan and Tumkur (Mysore). Sheets:—73, Parts of Districts Amraoti, and Wun (Berar) of Indur, and Surpur Tandur (Nizam's Dominions), of Wardha, Chanda, Nagpur, and Bhandara, and of Native State Bastar (Central Provinces), 78, District Chingleput, and parts of North Arcot and Salem (Madras Presidency) and Kolar (Mysore). 111, Parts of Districts Muzaffarpur, Darhanga, Bhagalpur and Purnea (Bengal), and of Nepal.—Assam Survey, 1 inch to 1 mile. Sheet No. 38 (2nd edition), Districts Kamrup and Darrang. Seasons 1866 to 1868, 1872 to 1875, and 1885–86.—Bengal Survey, 1 inch to 1 mile. No. 103, Angul Estate (Orissa). Season 1888–89. —Bombay Survey, 1 inch to 1 mile, No. 154, Parts of Baroda State, Rewa

Kantha Agency and Broach District. Seasons 1875–76 and 1890–91. No. 186, Parts of Rewa Kantha Agency and Khandesh District. Season 1889–90.—Punjab Survey, 1 inch to 1 mile, No. 227, District Ferozepore, Faridkot, and Patiala State. Seasons 1877–79 and 1887–88. No. 241, District Hissar and Patiala State. Seasons 1876–78, 1883–84, 1887–88, 1889–90. No. 274, Districts Hissar and Karnal and Patiala State. Seasons 1870–72, 1882–84, and 1887–88.—North-Eastern Frontier, 1 inch to 4 miles, No, 15, N.E. (2nd edition), parts of Naga Hills, Naga Tribes and Manipur (Assam), and of District Upper Chindwin (Upper Burma). Season 1885–86. With Supplement. No. 15, S.E. (4th edition), parts of Manipur (Assam) and of District Upper Chindwin (Upper Burma). Seasons 1881–82 and 1886–88. No. 22 S.W. (2nd edition), parts of Singpo Naga Hills and of the Upper Irrawaddy and Chindwin Valleys (Upper Burma). Seasons 1887–92. No. 23, S.W. (6th edition), parts of Districts Bhamo and Katha (Upper Burma). Seasons 1887–88, 1889–90.—South Eastern Frontier, 1 inch to 4 miles, No. 1, S.W. (2nd edition), parts of the Lushai and Chin Hills, of the Districts of Upper Chindwin and Pakokku (Upper Burma), of Northern Arrakan (Lower Burma), and of the District and Hill Tracts of Chittagong (Bengal). Seasons 1853–66, 1871–72, 1888–90, and 1891–92. —South-Eastern Frontier, 1 inch to 8 miles, No. 4, parts of Districts Katha, Bhamo, Ruby Mines, Shwebo, Sagaing, Mandalay, and Shan States (Upper Burma). Seasons 1886–91. No. 6, parts of Districts Toungoo, Shwegying, Salween, and Tharrawaddy (Lower Burma), District Pyinmana and South Shan States (Upper Burma), and of Siam.—Central India Agency, 1 inch to 16 miles. 2 sheets. Additions and corrections to May 1891.—District Backergunge, 1 inch to 4 miles. Additions and corrections up to June 1892.—Map of the Meerut Division, prepared in accordance with Govt. N. W. P. and Oudh P. W. Dept. Circular, No. E., dated May 16th, 1872. Revised in March, 1890. 3 Sheets. 1 inch to 4 miles. —Map of Agra Division, prepared in accordance with Govt. N. W. P. and Oudh P. W. Dept., Circular No, E., dated May 16th, 1872. Revised in March 1890. 1 inch to 4 miles. 2 sheets.—Burma and its adjacent countries, 1 inch to 48 miles. October 1892.—Map to accompany Preliminary Report on the Chin-Lushai Country, dated December 1892. 1 inch to 8 miles. (No. 204, Intelligence Branch.) 31 *sheets.* (*Stanford Agent.*)

AFRICA.

Nyasaland. **Wiese.**

Rugg's New Map of the Western Nyasaland Gold-fields. Specially illustrating the explorations of Carl Wiese, from 1885 to 1891. Scale 1 : 1,000,000, or 13·6 geographical miles to an inch. By Rowland Rugg. London, Forster Groom. Cape Town, Juta, 1892. *Price* 10*s.* 6*d.*

This map has been compiled to illustrate the explorations of Carl Wiese, between the years 1885 and 1891, and shows his routes, the trading stations, and positions of the old Portuguese gold-fields of Northern Zambesia. In the construction of the map the route surveys of Carl Wiese, and the travels and works of Monteiro, Gametto, Lacerda, Livingstone, Bowler, and others, have been used, and the Portuguese statistics of the Maravia gold exportations for the years 1810, 1830, and 1885, have been consulted by the compiler. Numerous useful notes on the character of the country, the minerals, game, &c., are given with some remarks as to routes and commerce. As, practically speaking, there has been no previous good map of this district, this cannot fail to be of service to any person travelling in this part of Africa, as routes are laid down, and the localities where gold is found are shown in yellow.

Transvaal. **Penning.**

Stanford's Map of the Transvaal Gold-fields, with the geology of the Southern Part of the Transvaal. By W. H. Penning, F.G.S., &c. (late H.M. Geological Survey of England), 1893. Scale 1 : 1,000,000, or 13·6 geographical miles to an inch. London, published by E. Stanford, 1893. *Presented by the Publisher.*

The geological colouring which appears on this map is founded on the surveys of Mr. W. H. Penning, who is also the author of the pamphlet *The Geology of the Southern Transvaal*, which accompanies the map. Although the area geologically coloured is small when compared with the whole of the South African Republic, it

nevertheless embraces an area 450 miles in length and about 50 miles in breadth. A plan of the Witwaters Rand Gold-field is given on an enlarged scale, and geological sections from Klerksdorp by the Houdtbosch Rand and the High Veldt to Duibels' Kantoor, and across De Kaap Valley by Barberton to Swaziland; a geological section on a still larger scale from Houdtbosch Rand across the Witwaters Rand to the Megaliesberg Mountains is also given.

Tunis. **M. le Ministre de l'Instruction Publique.**

Atlas Archéologique de la Tunisie. Édition Spéciale des Cartes Topographiques publiées par le Ministère de la Guerre, accompagnée d'un Texte Explicatif par MM. E. Babelon, R. Cagnat, S. Reinach, Membres de la Commission de l'Afrique du Nord. Livraison 1. Paris, Ernest Leroux, Éditeur, 1893.

This is the first issue of an archæological atlas of Tunis. The map employed as a basis is that which has been prepared under the direction of General Derrécagaix, and published by the Service Geographique de l'Armée, Paris. In the compilation of this work very valuable assistance has been rendered by the officers of the topographical survey, who, in the course of their duties, have taken notes of all the ruins and mentioned them with particulars in their reports, which have been made all the more valuable by the plans, drawings, and photographs, which have accompanied them. The Commission de l'Afrique du Nord has entrusted to three of its members, whose names are mentioned in the title, the preparation of this atlas for publication. The position of each ruin is indicated in red with a number attached, by the use of which a short description of the ruin itself can be found in the indices given. It is the intention of the Commission to publish with each part a scientific description of the country embraced in the map, in the hope that it may be serviceable, not only to archæologists, but to all who take an interest in a country which affords such abundant evidence of a past prosperity.

AMERICA.

Argentine Republic. **Nolte.**

Plano Catastral de la Provincia de Entre-Rios, construido segun los datos mas recientes. Scale 1:1,500,000, or 6·8 geographical miles to an inch. Casa Editora, Ernest Nolte, Libreria Alemana, Buenos Aires, 1892.

A considerable amount of detail is given on this map; it shows the positions of the different colonies, together with the location and extent of private estates, as well as the names of the owners. All means of communication are laid down, and a general map of the railways of the Argentine Republic is given as an inset.

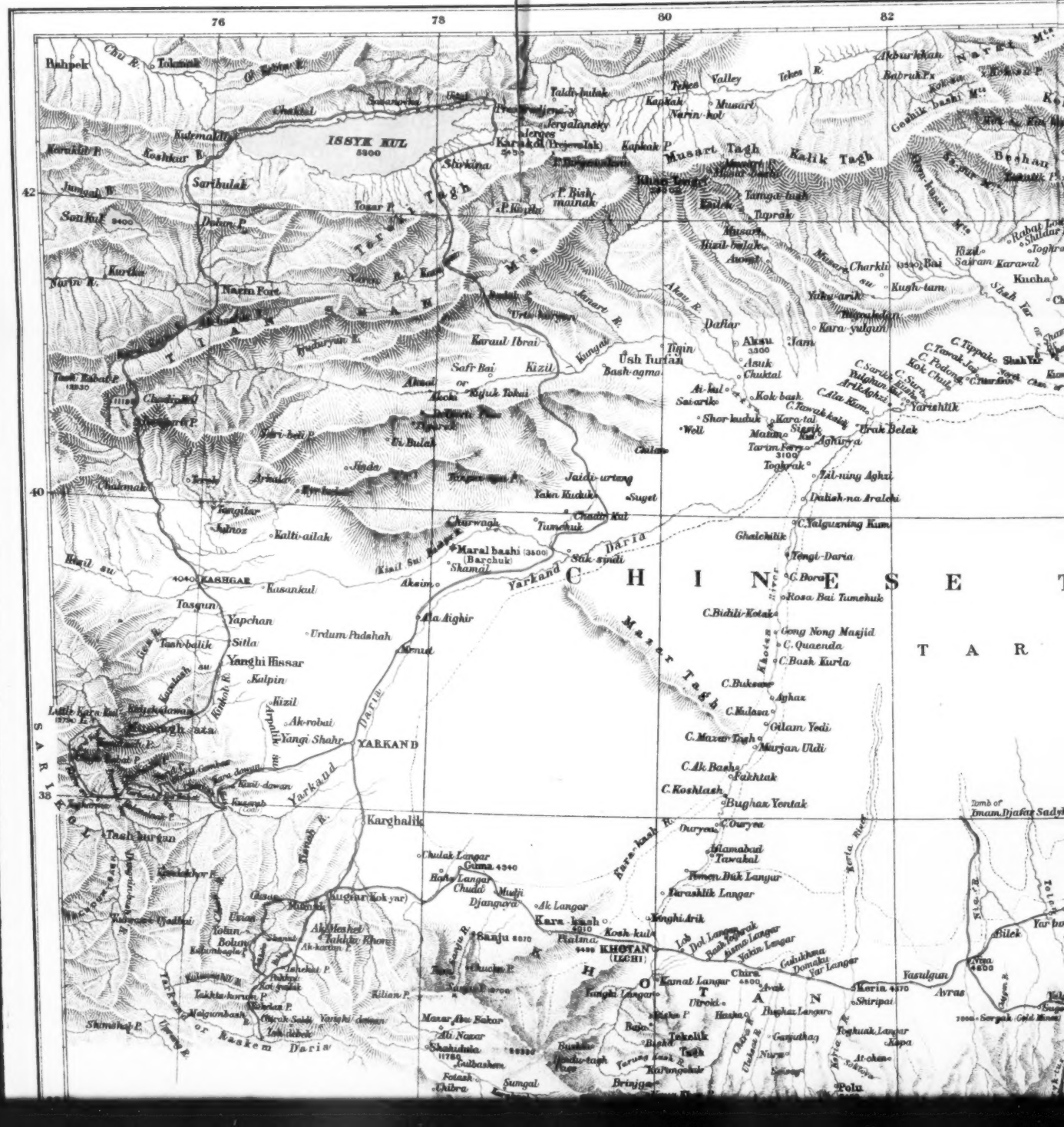
PHOTOGRAPHS.

Australia. **Elder Scientific Exploration Expedition.**

Two Albums containing one hundred and seven photographs taken by members of the Elder Scientific Exploration Expedition, 1891–92. *Presented by the South Australian Branch of the Royal Geographical Society of Australasia.*

These photographs, which have been taken by members of the Elder Scientific Exploration Expedition of 1891–92, form a valuable addition to the Society's Collection. They give a very clear idea of the country traversed by the exploring party, the views having been well chosen. There are also several interesting photographs of the natives. Considering the difficulties under which these photographs were taken, they are very satisfactory, and are made all the more valuable by having been carefully labelled.

N.B.—It would greatly add to the value of the collection of Photographs which has been established in the Map Room, if all the Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.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C. Bidili-Kotak
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Khaidu-gol
Kunish
Asmo-ku
Aghar-bulak
Urma Tikeng
Shah Shanza
Kara Kisi
Ishak Tal
Toghrachi Akkur
Bugar
Bota Kul
Yandem
Ak Chigh
Kuenchi Akchigh
Kultokuit Kul
Kaiz Kul
Yengi Kul
Ughuk Kul
Kogelik
Chigalik
Kirchin
Maikol
Boskul
Achik
Yata Bolda
Kara Dawan
Aryhun
Tokam
LOB NOR LAKE
Kara-kurchin
Tumak-kaul
Uitong
Astchi-bulak
Kuchug-ata
Jan-bulak
Chakilik
Cherchen River
Cherchen
Tatran
Kara-tugrak W.
Chapan-kaldy W.
Yaka-shar
Tatlyk-bulak Spr.
Yakab-bai W.
Cherpalik
Kalasi W.
Ketmik
Yantak-kuduk
Kara-kuran
Tailak-tuban W.
Akbai W.
Kum-ugat Spr.
Shiuldun W.
Chengelik W.
Khadyr-sha W.
Balgana Spr.
Kara Sai
Ak-tagh
Bash i Kul
Tenghi-abad
Tenghi Bessar
Chadar
Chachu
Tokkonia
Char Shamba
Usk-kara-tangar
Toghrak Dhung
Inchiki R.
South Channel of Tarim R.
Kum Arik
Tarim R.
Lit Yuldus Valley
Dagit
Fort
Khaidu-gol
Ak Tagh
Kuruk Tagh
Tiugh-tam Mts
Kara-kurchin
Chigalik
Kuchug-ata
Tumak-kaul
Uitong
Astchi-bulak
Lob
Kara Burgal
Ruins of Old Lob
Tarlik Dawan
Chapchal-bulak
C. Tandashlik
C. Sal
C. Chakar Sai 8800
C. Balak
C. Kara Dawan P. 10000
Tash Dawan P. 13000
Tash Kul Bashi
Kalta Kul
C. Pushalik
Gashun Nor 9700
C. Kara Chokat
C. Mandalik
Chapan Tagh
C. Chapan Bash Kul
Chong-yur
Balgyn-bashi
C. Kara Chokat 12000
C. Mandalik
C. Kara Chokat
Kara Dawan P. 12000
Kara Tagh
Tokai 12000
Kara Tagh
Mt. Sulaintagh
Guidja R.
Mt. Kroraidik
Asiag Kum Kol
Unfreezing Lake
Chong Kum Kol
Kum Dawan P. 14400
Mazar Dawan P.
Kalta Kul Khot.
Kalta Ollak
Tokkuzluk R.
Tabbalong
Achik Kul
Akka Tagh
Tokuz Dawan
Kum Darya
Podchalik R.
Yantak R.
Chakmak R.
Kara-muran R.
Kara-kuran R.
Kara-tugrak R.
Kara-kuduk R.
Kara-kuduk Spr.
Kara-kuduk Kul
Kara-kuduk Kul
Kara-kuduk Kul

CHINESE TURKISTAN
SHOWING THE SURVEYS AND ROUTES OF
Col. M. B. Pevtsof and K. I. Bogdanovitch
Scales
69 Miles = 1 Degree
104.3 Verats = 1 Degree
Natural Scale 1:3,800,000
CHINESE TARTARY
KASHGAR
YARKAND
KHOTAN (ILCHI)
Karghalik
Karakash R.
Yarkand R.
Tarim R.
Aksai Chin (White Desert)
Ling-zi Tang
Karatagh Plain
Kuen Lun
Altyn Tagh
Mazar Tagh
Yangi Daria
Yarkand Daria
Kara-kash R.
Khotan R.
Keria R.
Aksu
Ush Turfan
Kucha
Karashahr
Turfan
Toghrak
Yangi-Daria
Yangi Hissar
Yapchan
Tasgun
Sitla
Kalpin
Yangi Shahr
Maral bashi
Shamal
Chakmak
Tangitar
Kalti-ailak
Tumshuk
Ghaichilik
Rosa Bai Tumshuk
Urdum Padshah
Ak Aghir
Tash-balik
Kizil
Ak-robat
Tash-kurgan
Chulak Langar
Guma
Hata Langar
Chuda
Djangurd
Ak Langar
Kara-kash
Banju
Khotan
Chira
Yurung-kash R.
Kara-kash R.
Keria River
Tomb of Imam Djafar Sadik
Bilek
Yasulgun
Avras
Shiripai
Sorgak (Gold Mines)
Tokalik
Polu
Karatagh P.
Soda Plains
Kizil Jilga
Thaldat
Aksai Chin
C. Tograi Chusak
C. Togral Oba
C. Aksu
C. Babe Hatun
Shor Kul
Kangkul
Yarkand
Kashgar
Tash-kurgan
Yapchan
Yangi Hissar
Yangi Shahr
Karghalik
Khotan
Keria
Polu
Tokalik
Aksu
Kucha
Karashahr
Turfan
Toghrak
Yangi-Daria
Maral bashi
Ush Turfan
Aksai Chin
Ling-zi Tang
Karatagh Plain
Kuen Lun
Altyn Tagh
Mazar Tagh
Yangi Daria
Yarkand Daria
Kara-kash R.
Khotan R.
Keria R.
Tarim R.
Aksu
Ush Turfan
Kucha
Karashahr
Turfan
Toghrak
Yangi-Daria
Maral bashi
Yangi Hissar
Yapchan
Tasgun
Sitla
Kalpin

KARASHAHR
Ba Drook Kul
Kuruk Tagh
Tiuguntam Mts
Tsichiki R.
Yenghi-abad
Bugar
Bota Kul
Yandem
Bashingha
Shinagha
Kuruk R.
Kuruchi-Akchigh
Kuruchi Sala
Kultokmit Kul
Aghia
Kaia Kul
Tengi Kul
Kirchin
Boskul
Yata Belda
Kara Dail
Arghan
Tokam
TURKISTAN
IM BASIN
LOB NOR LAKE
Kara-kurchin
Tumak Kul
Vitong
Jan-bulak
Chakhar Sai
Tash Kul Basin
Tash Dawan P.
Kalta Kul
Gashun Nor
Cherchen River
Tatran
Cherchen
Ruins of Old Town
Kalasi W.
Ketmaj
Yantak-kuduk
Akbai W.
Chargalik W.
Shiudun W.
Kara-muran
Tulan-tokhun W.
Kum-ogul Sai
Khadyr-sha W.
Yar-bungux
Middle R.
Kuruk-muran R.
Yandalik
Aing Kum Kul
Uninscribed Lakes
Achik Kul
Ak-tagh
Bash i Kul
Akka Tagh
Iman Mula
Barkhalu
NEXPLORED
LUN
E
N
Toku Day
Chakmak R.
Yoshalik R.
Tershik R.
Kaia R.
Kuruk R.
Kum-arik
Char Shamba
Tyekonia
Yenghi Hissar
Ush-kara-tungar
Yandem
Ak Chigh
Kuruchi Mazar
Aimo Chikar
Kuruk R.
Kuruchi-Akchigh
Kuruchi Sala
Kultokmit Kul
Aghia
Kaia Kul
Tengi Kul
Ulugh Kul
Kirchin
Boskul
Yata Belda
Kara Dail
Arghan
Tokam
Chigalik
Kuchag-ata
Tumak Kul
Vitong
Jan-bulak
Chakhar Sai
Tash Kul Basin
Tash Dawan P.
Kalta Kul
Gashun Nor
Cherchen River
Tatran
Cherchen